CENTER FOR NUTRITION POLICY AND PROMOTION

Family Economics and Nutrition Review

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UNITED STATES DEPARTMENT OF AGRICULTURE
Volume 9, Number 1
1996

Editorial Board

Family Economics and Nutrition Review is written and published each quarter by the Center for Nutrition Policy and Promotion, U.S. Department of Agriculture, Washington, DC.

The Secretary of Agriculture has determined that publication of this periodical is necessary in the transaction of the public business required by law of the Department.

Family Economics and Nutrition Review is indexed in the following databases: AGRICOLA, Ageline, Economic Literature Index, ERIC, Family Resources, PAIS, and Sociological Abstracts.

Family Economics and Nutrition Review is for sale by the Superintendent of Documents. Subscription price is $8.00 per year ($10.00 for foreign addresses). Send subscription orders and change of address to Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. (See subscription form on p. 63.)

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Income and Spending of Poor Households With Children

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This study examines the income and spending of poor households with children using data from the 1990-92 Consumer Expenditure Survey. Poor households were defined as those whose income and total expenditures fell below the poverty threshold. The majority of poor households were headed by a single parent, and the majority of the heads of poor households did not have a high school diploma. Food stamps was the most often received income source of these households and made up 21 percent of their before-tax income. Housing, food, and transportation accounted for approximately 78 percent of the total expenditures of poor households. Although these budgetary components accounted for a high proportion of total expenditures, 83 percent of these households did not own a home, and 45 percent did not own a vehicle. Implications of the results of this study for policy and program purposes are discussed.

Poor households with children are one of the most vulnerable groups in the U.S. population. Their reduced economic state affects not only their current situation but also the future prospects of their children. Past research has tended to focus on the income of these families. Little attention has been devoted to their allocation of resources. In order to provide a more complete picture of the economic situation of these households, this study examines the expenditures of these households as well as their income. In doing so, it addresses a gap in the economics literature on poor households and should be of use to policymakers and professionals concerned with these families.

Data Source

Data used in this study are from the interview component of the 1990-92 Consumer Expenditure Survey (CE), conducted by the Bureau of the Census for the Bureau of Labor Statistics. The CE is an ongoing survey that collects data on expenditures, income, and major sociodemographic characteristics of consumer units (for this study, the term consumer unit will be used interchangeably with household). A national sample of consumer units, representing the civilian noninstitutionalized population, is interviewed over the course of a year. The 1990-92 survey contains information from approximately 60,000 interviews.

There is a rotating sample design: each quarter, a portion of the sample consists of new consumer units introduced to replace consumer units that complete their participation in the survey. Each quarter is deemed an independent sample and is treated as such to incorporate the weights. Data from each quarter were therefore aggregated and expenditures annualized.

Households with at least one child under age 18 in the home and that were complete income reporters were selected for analysis. Complete income reporters are households that had provided values for major sources of income, such as wages and salary, food stamp benefits, and Social Security; however, even complete income reporters may not have provided a full accounting of all income from all sources. Approximately 86 percent of households surveyed in the 1990-92 CE were complete income reporters. The unweighted sample of complete income reporters consisted of 18,327 households with children; of these, 1,625 were deemed to be poor. Data were weighted to represent the population of interest.

To place poor households with children in perspective, nonpoor households with children were also analyzed. Tests of statistical significance (Chi-square and t-tests) were performed between the two groups using unweighted data and reported at the .01 level. The .01 level of statistical significance was selected rather than the more traditional .05 level to compensate for any possible clustering effect present in the data. Almost all differences in characteristics, income, and expenditures between the two groups were statistically significant at the .01 level; hence, all comparisons are significant unless noted.

Defining Poor Households

To study poor households, the first step is to define "poor." Typically, having an income below the U.S. poverty threshold (the weighted average threshold differs by household size) has been used as the definition. This definition poses problems, especially with the CE, because of nonreporting and underreporting of various sources of income (and because no income imputation is made for nonresponses in the CE).

As the average income of CE families in the lowest income quintile is below that found in Census reports and their total expenditures are twice their income *(10,12)*, it is likely that poor families in the CE either do not report certain sources of their income or they underreport them. Although part of the expenditure-income disparity may reflect purchasing on credit, it seems unreasonable that such a large amount of credit could be obtained. Using solely an income measure with the CE would likely result in many households being classified as poor, when in fact they are not. Some other definition for poor households is needed. Two other definitions that have been used by researchers involve total expenditures and receipt of various forms of public assistance.

The use of total expenditures as a proxy for income to gauge households that fall below the poverty threshold has some support in the economics literature. The permanent income hypothesis suggests that people smooth out their consumption over their lifetime based on their estimated lifetime income *(3)*. Whereas annual income is subject to transitory shocks, such as temporary unemployment, annual consumption or total expenditures are not likely to vary as much and therefore may be viewed as a measure of estimated lifetime income.

A study by McGregor and Borooah *(6)* found that a total expenditure-based measure, as opposed to an income-based measure, was a better indicator of poor households based on criteria such as ownership of consumer durables. This measure, however, failed to account for families with children in the CE who had low expenditures and a high savings rate; some families were putting money aside for future retirement, a new home, and/or children's education. For these families, their expenditures may have fallen below the poverty threshold, even though their income did not—so they were not what is usually regarded as poor households.

Receipt of public assistance is another possible way to identify poor households. To receive various forms of public assistance, such as Aid for Families with Dependent Children (AFDC) or food stamps, a household must meet some set low-income criteria. Receipt of money or in-kind benefits from one or more of these welfare programs therefore would seem to be a reasonable way to identify poor households. However, many poor households that are eligible to receive various forms of public assistance do not apply for them *(2)*. They may be unaware of their eligibility or if they are aware, they choose not to apply. Analysis of the CE data confirmed this. Some households with both low income and low total expenditures did not receive any forms of public assistance.

The majority (52 percent) of heads of poor households did not have a high school diploma; only 2 percent had a college degree.

Given the problems with income underreporting in the CE and with various measures of low income, this study used a measure based on both before-tax income and total expenditures to define "poor" households. Their income substantially exceeded their expenditures. Specifically, households were defined as poor if their before-tax income **and** total expenditures fell below the poverty threshold. The use of both income and expenditures alleviates the problems associated with using either individually. Households that underreport their income such that it fell below the poverty threshold would not be categorized as poor if their expenditures were above the poverty threshold. Similarly, households with low expenditures and an income above the poverty threshold would not be categorized as poor.

It should be noted that the definition of poor used in this study is rather strict. Of the households with children in the sample, 9 percent were classified as poor. By comparison, during the 1990-92 period, 16 to 18 percent of families with children were classified as being in poverty according to a Census report *(11)*. In addition, this definition of poor households (before-tax income and total expenditures below the poverty threshold) may include some nonreporters or underreporters of income with low expenditures.

Characteristics

The characteristics of poor households in this study are similar to those obtained in Census reports *(11)* and therefore will only be briefly discussed and compared with nonpoor households.

Average age of the household head[1] for poor households with children was 34 and for nonpoor households, 37 (table 1). Average household size was 4.4 for poor households. The average size of nonpoor households was 3.9. The majority of poor households with children (52 percent) were composed of a single parent (of whom 97 percent were mothers) and their children only. The actual proportion of single-parent households in the poor population is likely higher since single parents residing with extended family members are included in the "other" category. In contrast, 74 percent of nonpoor households with children were composed of a married couple and their children only.

The majority (52 percent) of heads of poor households did not have a high school diploma; only 2 percent had a college degree. For nonpoor households with children, 15 percent of heads did not have a high school diploma and 27 percent had a college degree. Fifty-seven percent of poor households with children were White and 43 percent were non-White; 21 percent were Hispanic (and could be of any race). A higher proportion of nonpoor households with children were White (86 percent) and a lower proportion were Hispanic (10 percent). A higher percentage of poor households with children resided in the urban Midwest (31 percent) than in other areas.[2] In the CE, urban areas may be identified by region, but rural areas are for the overall United States.

[1]The household head is defined as the person who owns or rents the home; in cases where there is joint ownership or renting status, the head is arbitrarily decided so is actually a co-head.

[2]Urban areas are defined as Metropolitan Statistical Areas (MSA's) and places outside an MSA of 2,500 or more people; rural areas are places of fewer than 2,500 people outside an MSA.

Table 1. Characteristics of poor and nonpoor households with children,* 1990-92

Characteristic	Poor	Nonpoor
Average age of head[1]	34	37
Average household size	4.4	3.9
	Percent	
Household type		
Husband-wife	30	74
Single parent (divorced/separated)	27	12
Single parent (never married)	24	3
Single parent (widowed)	1	1
Other[2]	18	10
Education of head		
No high school diploma	52	15
High school diploma	33	32
Some college	13	26
College degree	2	27
Race		
White	57	86
Black	39	11
Other	4	3
Ethnicity*		
Hispanic	21	10
Non-Hispanic	79	90
Region[3]		
Urban		
Northeast	15	17
South	22	21
Midwest	31	27
West	21	21
Rural	11	14

[1]The household head is defined as the person who owns or rents the home; in cases where there is joint ownership or renting status, the head is arbitrarily decided.
[2]Includes husband-wife or single-parent households residing with others, and grandparents or others providing primary care for children.
[3]Urban areas are defined as Metropolitan Statistical Areas (MSA's) and places outside an MSA of 2,500 or more people; rural areas are places of fewer than 2,500 people outside an MSA.
*All differences in characteristics between poor and nonpoor households were statistically significant at $p \leq .01$ based on unweighted data.

Sources of Income

Poor households with children reported income from a variety of sources (table 2, p. 6). Food stamps was the most often received income source with 69 percent of poor households reporting income from this source. Given the income of these households was below the poverty threshold and eligibility for food stamps is set at 130 percent of this threshold, one would expect an even higher proportion to have received food stamps. Food stamps, however, also has an asset qualification.[3] In addition, as previously discussed, many families eligible for public assistance, such as food stamps, do not participate in these programs. Food stamp benefits were received by 6 percent of nonpoor households with children. As food stamp eligibility is set at 130 percent of the poverty threshold for families with children, near-poor households would be eligible.

Wages or salary and public assistance were the next two most often received income sources of poor households; 54 percent of poor households received each of these sources. Although the majority of poor households received income from wages or salary, many of the household heads worked part time (fig. 1, p. 7). For nonpoor households with children, wages or salary was the most often received income source, received by 94 percent of these households.

[3]Assets of these families were not analyzed because the CE does not contain detailed asset data.

Income from alimony, child support, or regular contributions[4] was received by 14 percent of poor households with children. Since more than half of these households were single-parent households and child support is included in this source, this proportion may seem low. Many single parents with children, however, do not have child support awards,[5] and even when they do, the full amount due is often not paid *(4)*.

Twenty-four percent of poor households received income from other sources, which includes income from pensions, Supplemental Security income, unemployment compensation, or owned businesses. Eight percent received Social Security income (which includes disability insurance payments), but only 2 percent received interest or dividend income. By comparison, 30 percent of nonpoor households had interest or dividend income.

Average Income

Before-tax income of poor families with children averaged $8,633 and per capita income averaged $1,962 (table 3). After-tax total and per capita income were slightly higher than before-tax income, probably because of the Earned Income Tax Credit that provides a direct grant to households whose credit exceeds their tax liability. The after-tax per capita income of nonpoor households was

[4]These three income sources are combined in the CE public use tape; "regular contributions" are periodic payments from a nongovernment, nonhousehold source, such as extended family.

[5]The reasons for single mothers not having a child support award are, in order of prevalence: Did not want award, did not pursue award, other reasons, father unable to pay, father could not be located, other settlement/father in household, and final agreement pending *(4)*.

Table 2. Percentage of poor and nonpoor households with children with income source,* 1990-92

Income source	Poor	Nonpoor
Wages or salary	54	94
Public assistance	54	4
Food stamps	69	6
Alimony, child support, or regular contributions[1]	14	11
Interest or dividends	2	30
Social Security	8	4
Other[2]	24	30

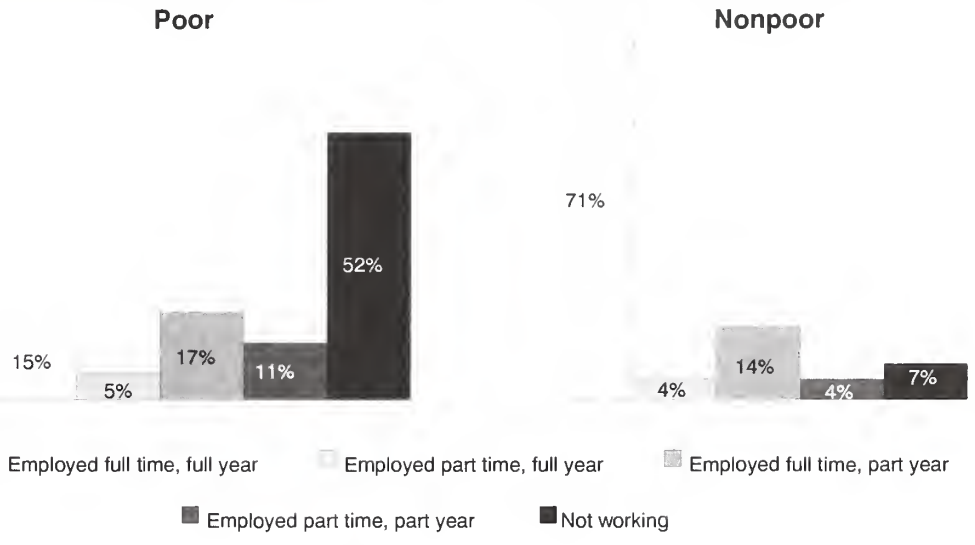
[1]Regular contributions are periodic payments from a nongovernment, nonhousehold source.
[2]Includes income from pensions, Supplemental Security Income, unemployment compensation, or owned businesses.
*All differences in income sources between poor and nonpoor households were statistically significant at $p \leq .01$ based on unweighted data.

Table 3. Income of poor and nonpoor households with children, 1990-92

Income source	Poor	Nonpoor
Before-tax income*	$8,633	$41,670
Per capita*	1,962	10,685
After-tax income*	8,688	37,873
Per capita*	1,975	9,711
	Percentage of before-tax income	
Wages and salary*	35.1	86.9
Public assistance*	26.7	0.4
Food stamps*	21.2	0.3
Alimony, child support, and regular contributions*[1]	2.7	1.1
Interest and dividends*	0.1	1.1
Social Security	4.8	0.8
Other*[2]	9.4	9.4

[1]Regular contributions are periodic payments from a nongovernment, nonhousehold source.
[2]Includes income from pensions, Supplemental Security Income, unemployment compensation, and owned businesses.
*Differences in dollar amounts between poor and nonpoor households were statistically significant at $p \leq .01$ based on unweighted data.

Figure 1. Employment status[1] of heads of poor and nonpoor households[2] with children,* 1990-92



[1]Full-time, full-year employment is defined as working 35 or more hours per week, 50 or more weeks per year, including any time off with pay. Part-time, full-year employment is working less than 35 hours per week for 50 or more weeks per year, including any time off with pay. Full-time, part-year employment is working 35 or more hours per week for less than 50 weeks per year, including any time off with pay. Part-time, part-year employment is working less than 35 hours per week for less than 50 weeks per year, including any time off with pay.
[2]The household head is defined as the person who owns or rents the home; in cases where there is joint ownership or renting status, the head is arbitrarily decided.
*Difference in employment status between poor and nonpoor households was statistically significant at $p \leq .01$ based on unweighted data.

approximately five times that of poor households. The dollar amounts received from each source of income, except Social Security, were significantly different for poor than nonpoor households.

Figure 1 shows the employment status of poor household heads: 15 percent were employed full time,[6] 33 percent were employed part time (28 percent were considered part time because they worked part of the year),[7] and 52 percent were not employed. When employment status of poor household heads and receipt of wages or salary by households are compared, a higher percentage of poor households received wages or salary than had an employed household head. This difference probably indicates another person(s) in these households, such as a spouse or older children, was employed—and not the household head. Of the household heads not employed, most (see table at right) reported not working because they were taking care of their family; only a small percentage reported they could not find work.

Reason head of poor households with children not employed	Percent
Taking care of family	65
Illness	18
Could not find work	8
Other (includes retired and going to school)	9

Most heads in nonpoor households worked full time (71 percent) or part time (22 percent). Again, for these households, the discrepancy between the percentage of heads who were

[6]Full-time employment is defined as working 35 or more hours per week, 50 or more weeks per year, including any time off with pay.

[7]Part-time employment includes working: (1) part time for the full year (working less than 35 hours per week for 50 or more weeks per year, including any time off with pay), (2) full time for part of the year (working 35 or more hours per week for less than 50 weeks per year, including any time off with pay), and (3) part time for part of the year (working less than 35 hours per week for less than 50 weeks per year, including any time off with pay).

employed and the percentage of households reporting wage or salary income is likely because a spouse—and/or older child—was employed.

Wages and salary accounted for the largest share (35 percent)[8] of before-tax income for poor households. Public assistance and food stamps made up the next largest shares (27 and 21 percent, respectively). Alimony, child support, and regular contributions provided only 3 percent of income; in dollar terms this amounted to about $230. For those receiving this income source, the average amount received by families with two children was $1,670. This amount was low compared with estimates of the "cost of raising a child"—expenditures on two children in the average single-parent household ranged from $7,430 to $11,080 in 1991 *(5)*. The bulk of income (87 percent) for nonpoor households was derived from wages and salary.

The incomes of the household groups examined do not include the value of some noncash benefits, such as medicaid and public housing. These benefits would raise the effective income of poor households. A study by the Census Bureau found that the poverty rate in 1990 declined when various noncash benefits were taken into account *(9)*. However, even with these benefits, the income of poor households remained low.

[8]Households with and without income from a particular source were used to calculate percent shares from that source.

Table 4. Percentage of poor and nonpoor households with children by expenditures incurred, 1990-92

Expenditures	Poor	Nonpoor
Housing	100	100
Food	100	100
At home*	99	100
Away from home*	50	91
Transportation*	80	99
Clothing*	85	96
Health care*	32	84
Entertainment*	69	95
Personal care*	41	81
Education or reading*	39	82
Child care*	7	31
Home furnishings or equipment*	50	80
Alcohol or tobacco*	51	69
Retirement or pensions*	56	97
Miscellaneous*[1]	34	81

[1]Includes life insurance, cash contributions, finance charges excluding mortgages and vehicles, and occupational expenses.
*Differences in expenditures incurred between poor and nonpoor households were statistically significant at $p \leq .01$ based on unweighted data.

Expenditures

All households with children, regardless of income, reported housing and food expenditures[9] (table 4). For a description of these and other expenses, see box. Half of poor households with children reported food-away-from-home expenses, compared with 91 percent of nonpoor households. Eating out is probably a luxury for many poor households.

[9]It should be noted that in the CE data larger expenditures are more likely to be remembered than smaller expenditures; therefore, these larger expenses are likely to be reported with more reliability than smaller ones. For example, a household is likely to remember their monthly rent, but may forget some of the food items they purchased in a given month.

Yang and Basiotis *(13)* found income to be positively related to food-away-from-home expenditures.

A much smaller proportion of poor than nonpoor households reported out-of-pocket health care expenses (32 vs. 84 percent). If poor households have access to employer-provided insurance, they may not incur health care expenses out-of-pocket. However, approximately half of heads of poor households were unemployed. Some may receive free medical care through medicaid; a Census Bureau study found that in 1987-89, one-third of people with incomes below the poverty threshold were covered by medicaid

Description of Expenditures

1. *Housing:* Shelter (mortgage interest, property taxes, or rent; maintenance and repairs; and home insurance) and utilities (gas, electricity, fuel, telephone, and water). It should be noted that for homeowners, housing expenses do not include mortgage principal payments.

2. *Food:* Food and nonalcoholic beverages purchased at grocery stores, convenience stores, and specialty stores including purchases with food stamps; dining out at restaurants; and household expenditures on school meals.

3. *Transportation:* The net outlay on purchase of new and used vehicles, vehicle finance charges, gasoline and motor oil, vehicle maintenance and repairs, vehicle insurance, and public transportation.

4. *Clothing:* Apparel items; footwear; and clothing upkeep services such as dry cleaning, alteration and repair, and storage.

5. *Health care:* Medical and dental services not covered by insurance, prescription drugs and medical supplies not covered by insurance, and health insurance premiums not paid by employer or other organization.

6. *Entertainment:* Fees and admissions, televisions, radios and sound equipment, and services.

7. *Personal care:* Appliances for personal care use, such as electric shavers; haircuts; and cosmetics.

8. *Education and reading:* Tuition, books, supplies, and other fees for elementary school, high school, and college, as well as newspapers and magazines.

9. *Child care:* Day care outside the home and baby-sitting or home care for children.

10. *Home furnishings and equipment:* Furniture, floor coverings, major appliances, and small appliances.

11. *Alcohol and tobacco:* Alcoholic beverages purchased at stores and restaurants, and cigarettes and other tobacco products.

12. *Retirement and pension:* Deductions for Social Security, private pensions, and self-employment retirement plans.

13. *Miscellaneous:* Life insurance, cash contributions, finance charges excluding mortgages and vehicles, and occupational expenses.

throughout this period *(8)*. Also, some households may go without medical care.

Child-care expenses were incurred by 7 percent of poor households and 31 percent of nonpoor households. The relatively small percentage of poor households with child-care expenses, compared with the percentage having employed heads (48 percent), may seem surprising. However, much child care is provided by a spouse or other relatives, such as grandparents *(7)*, who are likely not paid. In addition, many employed heads of poor households worked part time so they may be able to be home when their children return from school. Children may also be latchkey children.

A smaller proportion of poor households reported transportation expenses compared with nonpoor households (80 vs. 99 percent). A smaller proportion of poor than nonpoor households incurred entertainment, personal care, and education or reading expenses. Poor households may consider these expenses as luxuries given their economic status.

Fifty-six percent of poor households reported retirement or pension expenses, which include Social Security deductions (Social Security deductions are considered an expense in the CE and are not subtracted from after-tax income). By comparison, 97 percent of nonpoor households reported retirement or pension expenses. Having these expenses is related to the employment status of adult household members with implications for their retirement years. Without Social Security or pensions, they will likely remain disadvantaged and on public assistance.

Average Expenditures

Total expenditures averaged $9,986 for poor households with children, compared with $35,815 for nonpoor households with children (table 5, p. 10). For poor households, total expenditures exceeded their after-tax income by 13 percent. The difference may be caused by underreporting of income, incurring debt or drawing on savings to cover expenses, or misreporting expenses paid by others.

Housing accounted for the largest share[10] of total expenses for poor households with children (37 percent, fig. 2, p. 11). For homeowners, the shelter component of housing includes payments of mortgage interest but not mortgage principal;

[10]Households with and without expenses on a particular budgetary component were used to calculate percent shares on that component.

Table 5. Expenditures of poor and nonpoor households with children,* 1990-92

Expenditures	Poor	Nonpoor
Total expenditures	$9,986	$35,815
Per capita	2,270	9,183
	Percentage of total expenditures	
Housing	37.0	25.8
Food	31.7	15.8
At home	30.0	12.1
Away from home	1.7	3.7
Transportation	9.0	18.9
Clothing	6.4	5.3
Health care	1.5	4.2
Entertainment	3.1	5.4
Personal care	1.0	0.8
Education and reading	0.5	2.0
Child care	0.4	1.8
Home furnishings and equipment	2.1	4.2
Alcohol and tobacco	3.1	1.6
Retirement and pensions	2.7	10.8
Miscellaneous[1]	1.5	3.4

[1]Includes life insurance, cash contributions, finance charges excluding mortgages and vehicles, and occupational expenses.
*All differences in dollar amounts between poor and nonpoor households were statistically significant at $p \leq .01$ based on unweighted data.

Food made up the second largest share of total expenses for poor households at 32 percent—double the percentage share of nonpoor households.

mortgage principal payments are considered a reduction of liabilities in the CE and not an expense. The effective housing expenses of homeowners would, therefore, be higher than reported here. Most poor households (83 percent) rented their homes (fig. 3). A very small percentage of households stated they occupied a dwelling without payment; these people were classified as renters. Eight percent owned with a mortgage and 9 percent owned without a mortgage. Many of those owning without a mortgage resided in mobile homes, which are much less costly than other forms of housing. By comparison, 68 percent of nonpoor households owned their homes.

Food made up the second largest share of total expenses for poor households at 32 percent—double the percentage share of nonpoor households. However, the annual food expense of poor households was approximately $2,500 less, even though poor households had a larger average household size. It should be

Figure 2. Expenditure shares: Poor and nonpoor households with children, 1990-92

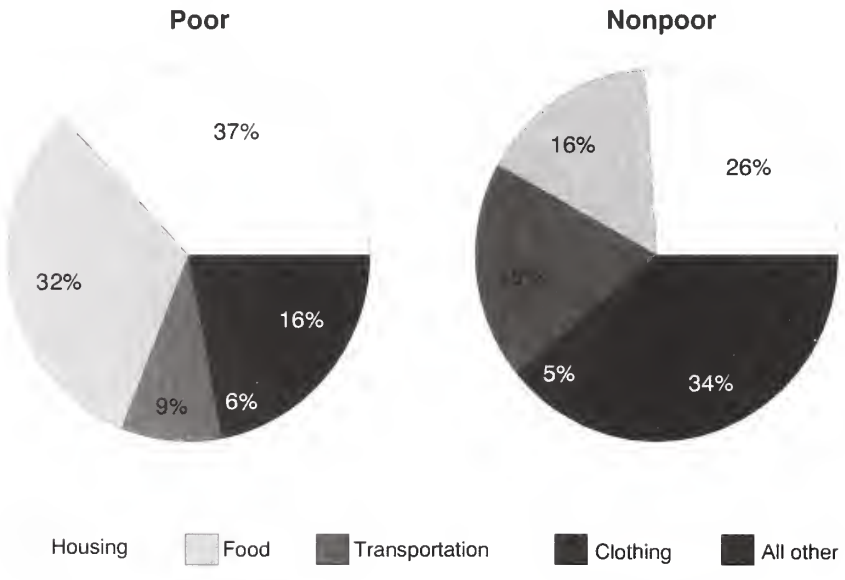
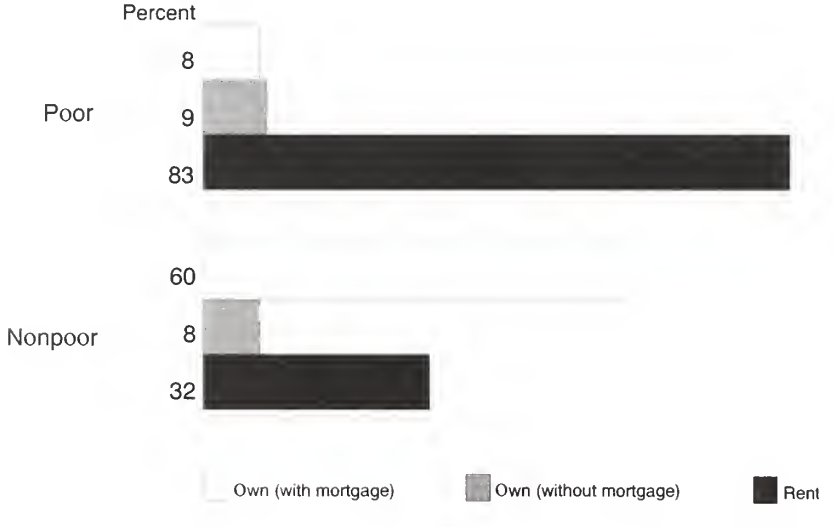


Figure 3. Housing tenure of poor and nonpoor households with children,* 1990-92



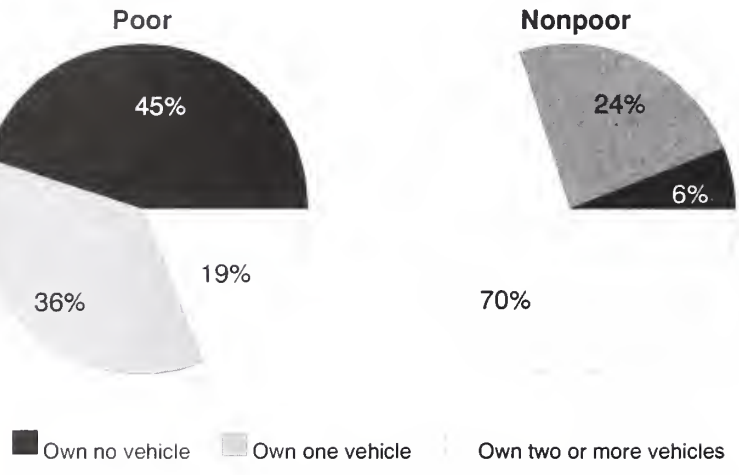
*Difference in housing tenure between poor and nonpoor households was statistically significant at $p \leq .01$ based on unweighted data.

noted that although food expenses include the value of food stamps used, the value of other food program benefits, such as WIC (Special Supplemental Nutrition Program for Women, Infants, and Children) and free meals at school, are not included in food expenditures. For households that receive these benefits, effective food expenses are likely higher than reported here.

Transportation expenses accounted for 9 percent of the total expenditures of poor households, compared with 19 percent for nonpoor households. This difference may be attributable to differences in vehicle ownership between the two groups—45 percent of poor households did not own a vehicle, whereas only 6 percent of nonpoor households did not own one (fig. 4, p. 12).

Other budgetary components each made up less than 10 percent of total expenditures for poor households. Health care accounted for 2 percent of total expenses, compared with 4 percent for nonpoor households. Child care accounted for less than 1 percent of total expenses for poor households. Alcohol and tobacco were a higher proportion of total expenses, but a smaller dollar amount, for poor households than for nonpoor households. Retirement and pensions made up 3 percent of total expenses for poor households and 11 percent for nonpoor households. The higher share for nonpoor households reflects the presence of an employed head with Social Security and pension deductions.

Figure 4. Vehicle ownership of poor and nonpoor households with children,* 1990-92



*Difference in vehicle ownership between poor and nonpoor households was statistically significant at $p \leq .01$ based on unweighted data.

Summary and Discussion

This study examined the income and expenditures of poor households with children using the 1990-92 CE, thereby filling a gap in the economics literature on the expenditures of these families. Because of limitations with the income data in the CE, it was necessary to define poor households using other variables in addition to income. The definition that was developed was based on income and total expenditures of households in relation to the poverty threshold. This definition can be used in future research. Comparisons of this measure of poor households to other measures (e.g., receipt of public assistance, income in the lowest quintile) would determine the extent of any difference in such measures.

Poor households with children were more likely to receive food stamps than any other source of income. Food stamps also provided about one-fifth of their income, indicating the importance of this Federal program to the economic security of poor households. Probably more than any other program, food stamps provides a safety net for poor households.

The total expenditures of poor households with children exceeded their after-tax income. If households are assuming debt to cover expenses, this debt is adding to their precarious economic status. Housing and food accounted for nearly 70 percent of total expenditures of poor households with children, compared with 42 percent for nonpoor households.

Although $3 out of every $8 spent went to housing, most poor households were renters. Therefore, they are not building up equity in a home and are vulnerable to rises in rental prices.

Food expenditures of poor households were about $2,500 less than those of their nonpoor counterparts. Poor households also had a higher average household size. There is some evidence that lower food spending puts people at nutritional risk *(1)*. Research needs to examine more closely the food situation of poor households to see how their lower food spending affects their diet.

Many poor households do not own a vehicle. This limits their job opportunities. When designing policies and programs aimed at moving poor people into the labor force, their dependence on public transportation must be considered.

A sizeable proportion of poor households did not have health care expenses, including insurance premiums. Future research should more closely examine the health care situation of poor households. Employer-provided insurance and medicaid may help many of these households; others may be going without medical care.

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Demographic and Economic Determinants of Household Income Polarization Among the States in America

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Using data from the 1990 Census, this paper examines the effects of household characteristics and factors related to the structure of the economy on income polarization among the States. Results indicate that women's labor force participation rate, the unemployment rate, education, and the percentage of manufacturing workers to service workers contribute to the determination of income polarization. Implications for public policy are discussed.

The results of recent studies *(3, 5, 11, 14, 16, 21, 22, 23, 28, 31, 33)* conclusively demonstrate that income distribution in America has become less equal. However, the causes that have led to this change are still debatable. Some researchers argue that it has been the result of changes in the demographic characteristics of the population, i.e., supply-side factors such as the increase in female-headed households, the shift in age distribution caused by the maturity of the baby-boom generation, and the rise in women's labor force participation. Others point to changes in the structure of the national economy, i.e., demand-side factors such as changes in occupational and industrial structure and technology.

This study examines differences in the distribution of household income among the States in America in 1989. It relates these differences to variations in supply-side and demand-side factors. The analysis thus focuses on demographic factors as well as economic conditions affecting household income distribution.

Background and Related Literature

The distribution of income among families reflects not only the economic structure of the society but also the opportunities, situations, and proprieties of family life *(35)*. Understanding the factors and conditions precipitating the increases in family income inequality and what this situation means for the family is paramount for devising social policies *(16)*.

One of the major worries that is associated with rising levels of income inequalities is the increasing bipolarization of income. Bradbury *(5)* noticed that the shrinking of the middle class would not be a reason for concern if families were generally getting richer. However, her data showed that median family incomes adjusted for the rate of inflation fell, and the percentages of families with higher and lower income increased.

Changes in the distribution of income may be a result of responses to changes in the characteristics of families. For example, an increasing proportion of families headed by females can lead to an increase in the number of families with low income *(27)*. On the other hand, changes in the economic structure of the society, such as unemployment rate or changes in the occupational and industrial mixture of jobs, may alter the distribution of income. Actual changes in the income distribution of American families are determined by the combined effect of several factors.

Kuznets *(19)* and Paglin *(26)* argued that the shift in the demographic composition of the population in the postwar era towards younger, older, and female-headed units fostered greater inequality within the various family types.

Women's labor force participation has been debated in the literature in terms of how it affects income distribution. In the 1960's and early 1970's, a major percentage of the wives who joined the labor force were from families where husbands had lower than average earnings *(18);* this participation reduced the income inequalities among families. Sweet *(32)* and Mincer *(24)* both using data from the 1960 census, Smith *(30)* for the period 1960-70, Danziger *(7)* for the period 1967-74, Harris and Hedderson *(12)* for the period 1967-76, and Bartlett and Poulton-Callahan *(1)* for the period 1951-76, showed that rising labor force participation by women has, actually, reduced income inequality.

In the late 1970's and 1980's, more wives from families where husbands had above-average incomes entered the labor force. Consequently, this situation led to speculation that a further increase in female's labor force participation could result in an increase in income inequality *(15)*.

However, studies by Horvath *(15)* using data for the year 1977, Beston and van Der Gaag *(2)* covering the period 1968-80, and Grubb and Wilson *(11)* for the 1967-88 period indicated that increasing labor force participation by wives actually continued to serve as an equalizing factor regarding household income inequality.

Compositional changes in the age structure of the population could affect income distribution. An increase in the number of household heads under age 25 or over age 65 (whose households have relatively low incomes) would increase income inequality. Lawrence *(20)* suggested that the entry of the baby-boom generation into the labor force and the resulting changes in the age distribution of the work force provide a powerful explanation of income inequality.

Among the macroeconomic factors that affect income distribution is the unemployment rate. Horowitz *(13)*, studying the 1954-71 period, concluded that unemployment increased income inequality within and among members of various races.

In this study, the income polarization ratio, defined as bottom-to-top quintile income ratio, is used to measure income inequality.

Some researchers have argued that increased bipolarization of income in America has been caused by shifts in the occupational and industrial mix of jobs in the economy. They attribute the shifts to declining employment in manufacturing industries and growth of high technology industries, service-producing industries, and low-paying occupations *(4, 10, 21)*. Kosters and Ross *(17)* pointed out that wages for service workers are about 83 percent of manufacturing wages.

Rosenthal *(27)*, however, examining the period from 1973 to 1982, concluded that the changes in the occupational structure alone do not support the claims of bipolarization. Also, the results of a study by Davidson and Reich *(9)* indicated that during the 1970-85 period, employment loss in manufacturing was at the tails rather than at the middle of the industry wage distribution and as a result, employment shifts out of manufacturing had an equalizing effect. According to the authors, the increase in inequality can be accounted for mainly by increasing wage differentials among industries.

Changes in the provision of transfer income may also affect income inequality. Studies showed that public transfers have equalizing effects on income distribution *(8, 34)*.

Education, as measured by the percent of the population completing high school, was found to be inversely related to income inequality *(6, 25, 29)*.

To sum up, explanations of the increase in income inequality in America include the following: (1) increased labor force participation by women from families with higher-than-average incomes, (2) growing numbers of youth and elderly who command lower incomes than other age groups, (3) an increase in unemployment rate has a differential effect on inter-industry wages leading to greater income inequality, (4) a decline in manufacturing employment may cause a reduction in the share of employment near the center of wage distribution, (5) a reduction in public transfers would increase the number of low-income units, and (6) an increase in the percent of the population completing high school would reduce income inequality.

Methodology

Data

The source of data for this study was the 1990 census *(36)*. Tabular data from published reports were used in the analysis.

Measures of Inequality

There are several measures of income inequality. They include, but are not limited to, the Gini Coefficient, Theil's Index of inequality, coefficient of variation, incidence of poverty, standard variation, standard variation of the logarithm of income, the normalized interquartile range, and the income polarization ratio. Each of the measures has different properties and is sensitive to different dimensions of the distribution.

In this study, the income polarization ratio, defined as bottom-to-top quintile income ratio *(22)*, is used to measure income inequality. In calculating quintiles of income, midpoints were used for the closed income classes and a Pareto curve was fitted to the open-ended class of income to approximate the mean measure of income (for more detailed methods of computation, consult Maxwell *(22)*, pp. 142-145).

Variables

Pretax incomes earned by households in 1989 were used for the calculations of income polarization ratios. A household consists of all the persons who occupy a housing unit. The incomes of households rather than families or individuals are used in this study. A household is an income-pooling unit, whereas families do not include households made up of individuals. In this study, the calculated income polarization ratios refer to inequality of pretax money income, and the ratios constitute the dependent variable in the statistical model.

The independent variables measuring demographic characteristics of households and economic structure of the State are explained as follows:

(1) Female's labor force participation: labor force participation rate for females 16 and older.

(2) Dependency ratio: summation of number of individuals under 18 and over 64 divided by number between 18 and 64 years old, represented as a percentage.

(3) Industry: ratio of manufacturing workers to service workers.

(4) Unemployment rate: unemployment rate for persons 16 years and older.

(5) Government assistance: average annual public assistance income.

(6) Education: percentage of population completing high school.

Previous analysis indicated a correlation (.614) between the variable "Female-headed households" and "Female's labor force participation." Therefore, "Female-headed households" was omitted from the regression model.

Model and Statistical Procedure

Ordinary least squares regression was used to regress the independent variables on the income polarization ratios. The following model was estimated:

$$G_i = a + b_1x_{1i} + ... + b_6x_{6i} + e_i$$

where G refers to the income polarization ratio; a is a constant term; $x_{1i}...x_{6i}$ denote the independent variables; $b_1...b_6$ are parameters to be estimated; e_i is random disturbance term; and i is a subscript corresponding to the 50 States and the District of Columbia.

An appropriate specification for the model is a logistics regression. However, ordinary least squares regression yielded the same qualitative results as a logistics regression, so the ordinary least squares model is reported for simplicity.

The model was tested for heteroscedasticity using the White Test and the Breusch-Pagan Test. Results showed that the null hypothesis indicating no heteroscedasticity was accepted using both measures.

Empirical Results and Discussion

Differences in Inequality

Table 1 shows quintile share distribution for all of the States and the District of Columbia. The poorest fifth of households earned 4.7 percent of total income in the State of Hawaii, compared with only 2.7 percent of total income in the District of Columbia.

The richest fifth of households obtained 43.3 percent of all income in the State of Delaware, compared with 52.1 percent of all income in the District of Columbia. It should also be noted that the middle quintile income share (middle 20 percent of the population)

Table 1. Percentage distribution of household income by State by quintiles, 1989

State	Quintiles				
	Lowest	Second	Third	Fourth	Highest
U.S.	3.6	9.5	15.7	24.1	47.1
Alabama	3.1	9.3	15.3	24.1	48.1
Alaska	4.6	10.4	16.5	24.9	43.6
Arizona	3.9	9.9	15.2	23.4	47.6
Arkansas	3.5	9.3	15.0	24.1	48.0
California	3.9	9.8	15.8	23.8	46.7
Colorado	4.1	9.9	16.0	24.1	45.9
Connecticut	4.1	9.8	15.6	23.3	47.2
Delaware	4.4	10.8	17.0	24.4	43.3
District of Columbia	2.7	8.2	14.2	22.7	52.1
Florida	3.9	9.8	14.8	22.6	48.9
Georgia	3.4	9.6	15.4	24.2	47.5
Hawaii	4.7	10.4	16.4	24.4	44.2
Idaho	4.4	10.7	15.7	23.4	45.7
Illinois	3.6	9.7	16.4	24.0	46.4
Indiana	4.2	10.4	16.0	24.0	45.3
Iowa	4.3	10.7	16.1	23.8	45.1
Kansas	4.0	10.2	15.5	23.2	47.0
Kentucky	3.2	9.1	15.3	24.2	48.2
Louisiana	2.9	8.3	14.8	23.9	50.0
Maine	4.3	10.5	16.1	23.8	45.3
Maryland	4.4	10.5	16.6	24.3	44.1
Massachusetts	3.5	10.1	16.5	24.6	45.2
Michigan	3.7	9.5	16.7	24.8	45.3
Minnesota	4.1	9.9	16.7	23.9	45.3
Mississippi	3.1	8.0	14.9	24.6	49.4
Missouri	3.7	9.9	15.3	23.4	47.7
Montana	3.9	10.5	15.7	24.2	45.7
Nebraska	4.3	10.7	15.8	23.6	45.5
Nevada	4.3	10.3	16.3	23.4	45.7
New Hampshire	3.3	10.4	16.5	23.0	46.7
New Jersey	4.0	9.9	16.0	24.0	46.1
New Mexico	3.4	10.0	15.3	23.7	47.5
New York	3.2	8.9	15.6	23.8	48.5
North Carolina	3.8	10.2	15.7	23.6	46.7
North Dakota	4.0	10.7	15.8	24.2	45.2
Ohio	3.8	10.0	15.7	24.1	46.4
Oklahoma	3.5	9.8	15.2	23.6	47.9
Oregon	4.2	10.3	15.6	23.3	46.6
Pennsylvania	3.9	9.8	15.4	23.9	47.0
Rhode Island	3.9	9.8	16.8	24.3	45.1
South Carolina	3.5	10.3	15.9	24.1	46.2
South Dakota	3.9	10.7	15.6	23.8	46.0
Tennessee	3.2	9.8	15.2	23.4	48.4
Texas	3.3	9.5	14.8	23.5	48.9
Utah	4.6	10.8	16.3	23.7	44.6
Vermont	4.6	10.5	16.5	23.9	44.5
Virginia	3.8	10.3	16.5	24.4	45.0
Washington	4.2	10.2	16.7	24.0	44.9
West Virginia	3.5	8.9	15.1	24.7	47.7
Wisconsin	4.5	10.4	16.2	23.7	45.1
Wyoming	4.3	10.6	16.3	24.3	44.5

Percentages in quintiles may not add up to 100 because of rounding.

Table 2. Income inequality within the United States, 1989

State	Inequality rank	Index of inequality	Income polarization ratio
U.S.	–	100.00	13.08
District of Columbia	1	147.55	19.30
Louisiana	2	131.80	17.24
Mississippi	3	121.79	15.93
Alabama	4	118.65	15.52
New York	5	115.90	15.16
Tennessee	6	115.60	15.12
Kentucky	7	115.14	15.06
Texas	8	113.30	14.82
New Hampshire	9	108.18	14.15
New Mexico	10	106.80	13.97
Georgia	11	106.80	13.97
Arkansas	12	104.82	13.71
Oklahoma	13	104.66	13.69
West Virginia	14	104.20	13.63
South Carolina	15	100.92	13.20
Massachusetts	16	98.70	12.91
Missouri	17	98.55	12.89
Illinois	18	98.55	12.89
Florida	19	95.87	12.54
North Carolina	20	93.96	12.29
Michigan	21	93.58	12.24
Ohio	22	93.35	12.21
Arizona	23	93.27	12.20
Pennsylvania	24	92.12	12.05
California	25	91.51	11.97
Virginia	26	90.52	11.84
South Dakota	27	90.14	11.79
Kansas	28	89.83	11.75
Montana	29	89.60	11.72
Rhode Island	30	88.38	11.56
New Jersey	31	88.07	11.52
Connecticut	32	88.00	11.51
North Dakota	33	86.39	11.30
Colorado	34	85.55	11.19
Oregon	35	84.79	11.09
Minnesota	36	84.48	11.05
Indiana	37	82.49	10.79
Washington	38	81.73	10.69
Nevada	39	81.27	10.63
Nebraska	40	80.89	10.58
Maine	41	80.50	10.53
Iowa	42	80.20	10.49
Idaho	43	79.43	10.39
Wyoming	44	79.13	10.35
Maryland	45	76.63	10.02
Wisconsin	46	76.62	10.02
Delaware	47	75.23	9.84
Utah	48	74.16	9.70
Vermont	49	73.93	9.67
Alaska	50	72.48	9.48
Hawaii	51	71.86	9.40

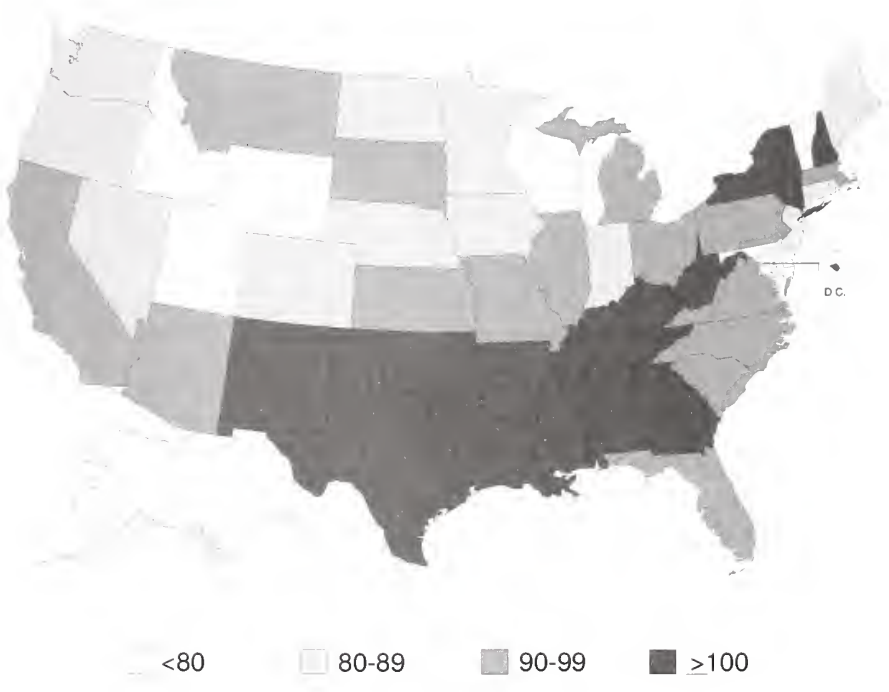
received 17.0 percent of all income in the State of Delaware, compared with only 14.2 percent in the District of Columbia. The percentages for the 50 States and the District of Columbia are shown in table 1.

The income polarization ratios, defined as the top-to-bottom share ratios, are calculated and presented in table 2. As the ratio is about 13 for the United States, the top quintile of households in 1989 received $13 of income for every $1 received by the bottom quintile.

In table 2, the income polarization ratio for each of the States is expressed as a percentage of the income polarization ratio of the United States. The income inequality in each State is expressed as a percentage of the inequality that exists in the United States. For example, the District of Columbia has an index of inequality of 147.55. This means that the District of Columbia's income polarization ratio is 47.55 percent greater than the income polarization ratio for the Nation, i.e., incomes are 47.55 percent more unequally distributed in the District of Columbia than in the entire Nation. Hawaii, on the other hand, has an index of inequality of 71.86, indicating that incomes in Hawaii are 28.14 percent more equally distributed than in the country as a whole.

It is clear from the figure that all Western States with the exception of New Mexico have indices of inequality less than 100, revealing lesser inequality in income distribution than in the Nation as a whole. On the other hand, most of the Southern States have indices of inequality greater than 100, showing greater inequality in income distribution than the Nation.

Indices of income inequality, 1989



...most of the Southern States have indices of inequality greater than 100, showing greater inequality in income distribution than the Nation.

The States are ranked in order of inequality in table 2. The District of Columbia has the most unequal distribution whereas Hawaii has the most equal.

Determinants of Inequality

Table 3, p. 20, provides descriptive information regarding the independent variables used in the analysis. The rate of female's labor force participation ranges from 41.7 percent in the State of Alaska to 50.8 percent in the District of Columbia.

The dependency ratio signifying the percentage of those under 18 and over 64 years to those between 18 and 64 years was the highest in the State of Utah at 82.2 percent and the lowest in the District of Columbia at 47.3 percent.

The variable education, which refers to the percentage of population completing high school, ranges from 23.9 percent in Nevada to 82.8 percent in Pennsylvania. The variable industry, representing the ratio of manufacturing workers to service workers, was the highest in North Carolina at 95.6 percent and the lowest in the District of Columbia at 9.3 percent.

Unemployment rate was the highest at 9.6 percent in Louisiana and the lowest at 3.5 percent in Hawaii. The government assistance variable, representing the average annual income provided by the government, ranges from $2,800 per household in Mississippi to $5,972 per household in California.

Table 3. Household characteristics and macroeconomic factors in the United States, 1989

State	Female's labor force participation	Dependency ratio	Education	Industry	Unemployment rate	Government assistance
Alabama	45.5	64.3	76.7	77.9	6.9	2,985
Alaska	41.7	54.8	35.6	17.7	8.8	4,934
Arizona	44.6	66.2	37.0	37.2	7.2	3,711
Arkansas	45.8	70.4	67.8	77.6	6.8	2,901
California	43.4	56.7	59.2	50.6	6.6	5,972
Colorado	45.4	56.6	45.3	36.3	5.7	3,638
Connecticut	46.2	57.2	62.3	62.6	5.4	4,864
Delaware	46.8	57.8	51.9	60.2	4.0	4,012
District of Columbia	50.8	47.3	43.6	9.3	7.2	3,927
Florida	45.8	68.0	34.9	31.0	5.8	3,803
Georgia	46.2	58.1	66.3	64.3	5.7	3,210
Hawaii	44.3	57.6	65.8	17.3	3.5	5,272
Idaho	43.5	74.5	52.1	48.2	6.1	3,321
Illinois	45.4	62.2	75.4	61.0	6.6	3,925
Indiana	45.6	63.4	72.3	85.6	5.7	3,613
Iowa	46.0	70.2	78.8	54.7	4.5	3,784
Kansas	45.0	68.1	62.9	50.5	4.7	3,740
Kentucky	44.4	62.7	78.1	65.1	7.4	3,282
Louisiana	44.8	67.2	80.6	36.5	9.6	3,114
Maine	45.7	62.5	70.6	60.7	6.6	3,557
Maryland	46.9	54.1	53.3	29.2	4.3	3,915
Massachusetts	47.0	56.5	76.0	49.6	6.7	4,711
Michigan	45.4	62.3	77.8	77.4	8.2	4,369
Minnesota	46.3	64.4	75.6	54.2	5.1	4,426
Mississippi	46.4	71.0	77.9	79.4	8.4	2,800
Missouri	46.1	65.9	70.8	58.8	6.2	3,314
Montana	44.8	69.8	60.0	22.0	7.0	3,620
Nebraska	45.9	70.4	71.4	39.6	3.7	3,729
Nevada	44.0	54.6	23.9	13.3	6.2	3,908
New Hampshire	46.3	57.2	45.8	72.7	6.2	3,722
New Jersey	45.8	51.8	62.6	50.9	5.7	4,298
New Mexico	44.2	67.4	54.6	22.9	8.0	3,325
New York	46.3	58.3	80.2	39.0	6.9	4,469
North Carolina	46.2	57.1	71.7	95.6	4.8	3,143
North Dakota	44.5	71.5	74.3	17.8	5.3	3,688
Ohio	45.5	63.3	75.9	73.8	6.6	3,736
Oklahoma	44.7	66.9	64.8	43.6	6.9	3,279
Oregon	44.8	64.6	49.0	55.1	6.2	3,798
Pennsylvania	45.3	63.7	82.8	61.3	6.0	4,041
Rhode Island	46.7	60.0	70.0	69.6	6.6	4,503
South Carolina	46.3	60.7	69.4	91.1	5.6	3,111
South Dakota	45.5	76.1	71.0	32.6	4.2	3,261
Tennessee	45.9	60.3	70.0	79.3	6.4	3,035
Texas	44.0	62.8	71.1	44.3	7.1	3,011
Utah	44.0	82.2	69.6	45.9	5.3	3,733
Vermont	46.5	59.2	59.0	44.3	5.9	3,966
Virginia	45.4	54.0	57.1	46.5	4.5	3,394
Washington	44.2	60.6	51.6	54.9	5.7	4,489
West Virginia	42.6	56.9	78.0	46.0	9.6	3,545
Wisconsin	46.1	65.7	78.4	81.9	5.2	4,356
Wyoming	43.8	67.4	43.4	18.5	5.9	3,410

The analysis that follows quantifies the effects of the differences in the above discussed independent variables on the distribution of household income.

Table 4 presents parameter estimates for the regression model of income polarization for the United States in 1990. The results indicate that women's labor force participation rate, education, and unemployment rate are statistically significant determinants of income inequality among the States. The ratio of manufacturing workers to service workers (industry) is a marginally significant determinant of income inequality among the States. The results of this research also suggest that the States' distribution of income has been impervious to the effects of dependency ratio and government assistance.

The rate of women's labor force participation is positively related to income inequality. This finding is in support of the contention that a further increase in women's labor force participation would lead to an increase in income inequality *(15)*.

There is an inverse relationship between education and income inequality. This finding is in support of previous studies *(6, 25, 29)*. The results also show that as the ratio of manufacturing workers to service workers increases, income inequality decreases. This finding is consistent with past studies *(4, 10, 21)*. Other results show that as the rate of unemployment increases, the top quintile of households gains income shares at the expense of the lowest quintile.

Table 4. Regression estimates of income polarization ratios for the United States, 1989

Variable	Regression coefficient (standard error)
Female's labor force participation	.619***
	(.133)
Dependency ratio	–.008
	(.028)
Education	–.175***
	(.039)
Industry	–.020*
	(.008)
Unemployment rate	.729***
	(.134)
Government assistance	–.00043
	(.0003)
Intercept	–3.791
Adjusted R^2	.74
F	24.8***

*p < .1.
***p < .001.

Conclusions and Implications

The increase in income inequality in the last decade in America has been viewed with anxiety and with concern that the country is drifting in the direction of "haves" and "have-nots." Understanding why the income distribution has become more bipolarized is an issue that is both of inherent interest for family economists and of relevance for public policy.

The ranking of States according to the measure of income inequality presented in this paper should help State policymakers to be aware of the extent of income inequality in their State and be cognizant of the social and economic policies that impact upon income inequality.

Among household demographic differences, the level of education has an impact on income distribution in the States. Also, among the independent variables reflecting the national economic structure, the unemployment rate and women's labor force participation are statistically significant in impacting on income distribution.

From a public policy viewpoint, several approaches must be considered simultaneously. Reduction of the unemployment rate through the creation of more jobs, either directly through government subsidized employment or indirectly through government stimulation of the economy, would influence the distribution of income. Various avenues for providing additional education and training for the disadvantaged segments of our population need to be explored and publicized. Efforts to promote the long-range economic advantages of "remaining in school" should be revitalized at all levels of government. Such policies would help to close the gap between the "haves" and the "have-nots."

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Factors Influencing Rural Southern Elders' Life Satisfaction

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Using 1987-88 data from a regional project involving 11 States, this study focused on four dimensions of well-being as measured by rural Southern elders' (n = 2,951) satisfaction with their economic status, independent living, social interactions, and psychological status. Findings show that, overall, rural Southern elders' satisfaction with their status is significantly affected by some perceived and actual housing, nutrition, and clothing status variables as well as socioeconomic and demographic characteristics, mobility, and concerns about loneliness and the location of their home. With all other variables controlled, actual housing and actual nutrition (measured by nutrition-related illnesses), race, physical disabilities, and a concern about loneliness were significantly related to all dimensions of well-being. Results are useful to policymakers who address health and health care, long-term care, social and community-based services, housing, financial security, and community involvement issues for the elderly.

When planning the agenda for the 1995 White House Conference on Aging, a panel of expert policy researchers suggested the following characteristics be used to determine how conference recommendations should address the needs of special groups in the elderly population: Race and ethnicity; gender; urban, rural, and suburban residence; elders 85 years and older; the poor and near-poor; and veterans *(25)*. Meeting the needs of the elderly requires consideration of the heterogeneity of this population.

This research focuses on one of those special groups—rural Southern elders. In 1990, 13 percent of all persons in the Southern region[1] were 65 years and older. Thirty-one percent of Southerners 65 years and older lived in rural areas *(32)*. The South has a higher share of the Nation's poor as indicated by poverty rates and income (a determinant of poverty status). The Southern region had a poverty rate of 16 percent in 1991,

[1]Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

compared with 12 to 14 percent for the other regions *(33)*. In 1991, the median household income in the South was $27,000, compared with $33,000 in the Northeast, $32,000 in the West, and $30,000 in the Midwest *(31)*. Also, the South has a higher percentage of adults with multiple disadvantages[2] *(21)*. Older and rural householders have less income than younger and urban householders. In 1991, householders 65 years and older had a median household income of $17,000, compared with younger householders whose median household income was $35,000 *(31)*. In 1989, mean income of rural elder households was $15,400 compared with $20,400 for urban elder households *(28)*.

The U.S. population continues to age. The median age was 32.8 years in 1990; it is expected to increase to 35.5 years by the turn of the century and peak at 39.1 years in 2035. Although current estimates indicate that one in eight Americans are 65 years and older, by 2020 one in six and by 2030 one in five Americans are expected to be elderly *(7)*. In 1990, the median age for persons in all urban and rural areas (32.5 and 34.1 years) and Southern urban and rural areas (33.4 to 34.7 years) was similar *(32)*. Because of these demographic trends and the characteristics of the region where they live, studying the well-being of the Southern elderly will help in determining how best to meet the needs of a graying U.S. population.

[2]Includes disadvantages such as higher rates of poverty, high school dropouts, and public assistance.

Previous Studies

Housing

Adequate housing is an important component of life satisfaction. The degree to which families are satisfied with their housing is influenced by their age, values, ability to function within the home, and repair needs. A study of rural elders in two Southern States found they tend to be more satisfied with their housing compared with younger cohorts *(10)*. Also, elders' housing decisions are more likely than those made by younger cohorts to be influenced by economic and personal values.[3]

A study of the rural South found that when elders compared their housing situation with that of other elders they know, they believed their own housing situation was worse *(9)*. Data from the U.S. Departments of Commerce and Housing and Urban Development *(35)* show that 8 percent of U.S. elderly householders lived in homes with plumbing, heating, upkeep, and electrical problems in 1991. Among those with these housing problems, 38 percent said the problems were severe. For those who described their problems as severe, 41 percent lived in the South and 35 percent lived in rural areas. Other findings indicate that those 65 years and older spent less on home maintenance than those 25 to 64 years old *(34)*.

[3]"Economy—place[s] emphasis on the economic uses of goods and services. They [individuals] base choices on selling price and what they consider sound business judgement. They are conservative and take only calculated risks....Personal—view[s] the physical and social environment from a personal perspective. The group is individualistic and desires independence and self-expression" *(10)*.

Other factors that may influence housing satisfaction for the elderly include the size of the home and costs associated with adapting the home to meet changing needs. A study of older women in a Southern State found that married women were most dissatisfied with the size of their house (too small), followed by maintenance and yardwork problems *(4)*. Of pre-retirees (40 years and older) in some Western and Midwestern States, 22 percent believed the cost of modifying their home to accommodate a wheelchair would be prohibitive *(18)*.

Nutrition

Another important determinant of elders' well-being is their diet. In *Healthy People 2000 Review 1993*, five leading causes of death—coronary heart disease, some cancers, stroke, noninsulin dependent diabetes mellitus, and coronary artery disease—are attributed, in part, to Americans' diets *(36)*. "Diets high in calories, fat, saturated fat, cholesterol, and salt, and low in such fiber-containing foods as fruit, vegetables, and whole-grain products, are associated with risks of those diseases" *(11, p. iii)*. Poor diets also influence other conditions (e.g., overweight and osteoporosis) that affect well-being.

Some segments of the population are still more likely than others to be undernourished *(20, 36)*. Among the elderly, being undernourished is related to inappropriate food intake, poverty, social isolation, living arrangements, disability, diseases, and chronic use of medications *(5, 12, 22)*. Elderly women who consumed low amounts of protein (1.47 g/kg body cell mass) were more likely to experience functional losses (in lean tissue, muscle functioning, and immune response) than those who received adequate amounts of protein (2.94 g/kg) *(6)*.

Although the elderly need to be concerned about excessive energy intakes, maintaining diets that ensure adequate energy intake to meet the RDAs is also important among this population. Murphy et al. *(20)* found that among people 65 to 84 years old, higher energy intake (kcal)[4] was positively associated with the amount spent on food, number of meals consumed, percentage of kcal from snacks, and good or excellent self-described health status when other variables were held constant. Also, for elderly men, weight was positively associated with energy intake. A factor that negatively influenced elderly men's energy intake was the percentage of kcal from cereals. Women were more likely than men to have diet and medical problems that were negatively related to higher energy intakes. Women and men 65 to 84 years old who had poor diets were likely to be dieting to lose weight and did not like breakfast.

Living alone may influence dietary status of the elderly. Compared with recently widowed elders, those who were married rated mealtime as an enjoyable time more often *(26)*. Murphy et al. *(20)* found that women 65 to 84 years old who lived with their spouse had higher reported energy intakes than those who lived alone or with others. Among elders who lived alone, those with higher income were more likely than those with lower income to believe that health and nutrition were related *(3)*.

[4]"The energy requirement of an individual is the level of energy intake from food that will balance energy expenditure when the individual has a body size and composition, and level of physical activity, consistent with long-term good health; and that will allow for the maintenance of economically necessary and socially desirable physical activity" *(38)*.

Clothing

Reports on elders' well-being generally do not focus on their clothing needs. However, the psychosocial benefits as well as the protective role of clothing are important to perceptions of well-being across the life cycle *(14)*. Rural Southern elders' concerns for clothing are more likely to be influenced by costs, style, and fit than by socio-demographic characteristics *(9)*. In 1992, people 65 years and older had an average before-tax family income of $20,890. This was the lowest average income of any age group, except for those less than 25 years old. Elders spent 4 percent of their total expenditure for apparel, compared with 33 percent for housing, 16 percent for food, 12 percent for health, 16 percent for transportation, and 19 percent for other goods and services *(37)*.

A study on garments worn to maintain thermal comfort showed that the elderly place a higher priority on comfort (92 percent) and washability (73 percent) than fashion (21 percent) when staying indoors. However, when going out, fashion becomes more of a priority (50 percent)[5] *(16)*.

Other Selected Factors

Living independently and degree of homeboundness reflect elders' physical disabilities and the type of assistance or support received *(15,23)*. A U.S. Department of Commerce report showed that in 1991-92 among the 48.9 million disabled[6] people, 34 percent were 65 years and older *(19)*. Disabled elderly women were more likely than disabled elderly men to use personal and/or technical assistance; use of assistance and devices (such as canes, wheelchairs, grab bars, and walkers) has a negative impact on subjective[7] perceptions of well-being among the elderly *(24)*.

Another factor that may affect elders' perceptions of well-being is living arrangement. In 1993, 24 percent of Americans 65 to 74 years old and 40 percent of those 74 years old and older lived alone *(27)*. Compared with elders who lived with others, those who lived alone—especially rural women—were more likely to be economically vulnerable *(1, 29)*. Elders who lived alone and had more severe physical problems were more likely than those with less severe physical limitations to experience financial strain. Also, elders who lived alone were likely to experience biophysical, psychological, financial, and social isolators[8] *(13)*.

[5]Percentages do not equal 100 because of multiple responses or nonresponses. For example, elders were asked if they believed their clothing was fashionable when they stayed at home/when they went out (yes or no); if the clothing was comfortable when they stayed at home/went out (yes or no).

[6]The author used data from the Survey of Income and Program Participation (SIPP). The definition of disability is broader than the one used in other Bureau of Census reports. A person was disabled if any of the following criteria were met: "(a) used a wheelchair; (b) had used a cane or similar aid for 6 months or longer; (c) had difficulty with a functional activity; (d) had difficulty with an ADL [activity of daily living]; (e) had difficulty with an IADL [instrumental activity of daily living]; or (f) was identified as having a developmental disability or a mental or emotional disability" *(19, p. A-1)*. Also, reported figures exclude persons living in nursing homes or other institutions.

[7]Subjective perceptions of well-being was defined as "satisfaction with health, finances, family relations, friendships, housing, recreational activity, religion, self-esteem, and transportation" *(24, p. S205)*.

[8]Biophysical isolators include limitations in mobility and hearing loss; psychological isolators include changes in self-esteem and roles; financial isolators include ability to purchase needed goods and services; and social isolators include limited contact with family and friends.

Compared with rural Southern elders who lived with others, those who lived alone were less concerned about food[9] and more concerned about housing[10] issues *(9)*. A study by the American Association of Retired Persons *(2)* found that elders' concerns for utilities, property taxes, homeowners' or renters' insurance, mortgage or rent payments, and upkeep and maintenance were influenced by different socioeconomic and demographic characteristics (including health limitations, race, annual income, gender, age, and marital status). Another study concluded that older, female, and black elders who lived alone were more likely than their respective counterparts who lived with others to have financial difficulties because of their lower income and greater likelihood of having physical limitations *(17)*.

Expenditure patterns are indicators of economic status. Although rural elders spend a higher percentage of their after-tax income than do urban elders (99 percent vs. 95 percent), rural elders spend less than urban elders on most goods and services. Exceptions are home furniture and equipment, gas and oil for transportation, and health care expenditures *(28)*.

Compared with the youngest cohort of Southern elders (age 65 to 74), the other cohorts (age 75 to 84 and 85+) had less positive perceptions of overall well-being (satisfaction with economic status, independent living, social interactions, and psychological status) and well-being related to independent living and social interactions. However, as age increased, elders' satisfaction with their economic situation increased *(8)*. Age, household income, household net worth, perceived locus of control, and perceived income adequacy were related to satisfaction with financial status among rural households in the West and Midwest *(30)*.

Previous studies suggest the complexity and interdependence of factors that influence well-being of the elderly population. This study considers that complexity and the multidimensional nature of well-being as measured by satisfaction with different aspects of life, specifically by examining rural Southern elders.

Models

The conceptual model for this study suggests that the following factors may affect elders' satisfaction: Actual and perceived status for nutrition, housing, and clothing; selected socioeconomic and demographic characteristics; concerns; and degree of mobility (fig. 1). For this study, elders' satisfaction with their economic status, independent living, social interactions, and psychological status are examined.

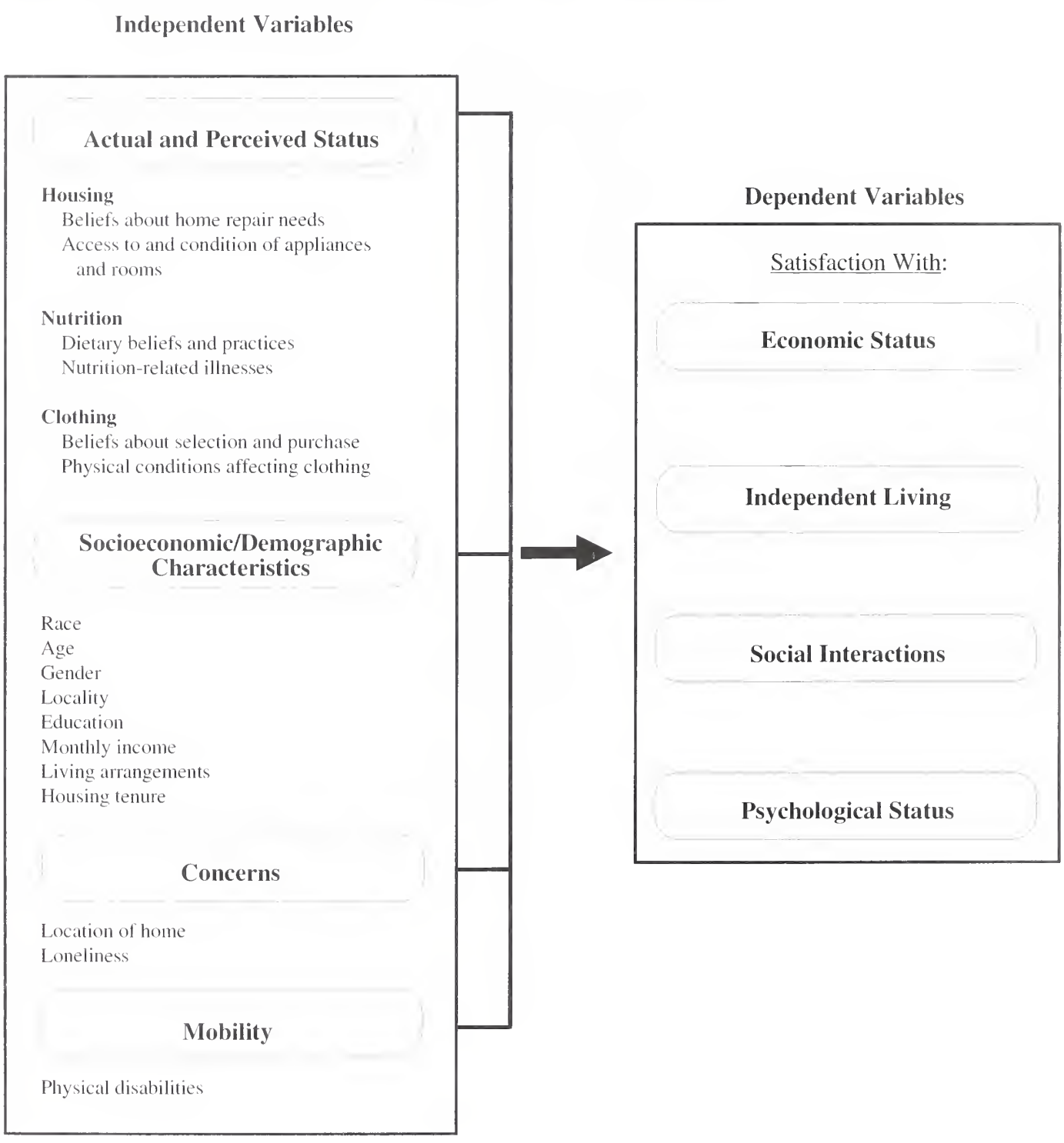
Linear models for satisfaction were estimated with four ordinary least squares regressions. Satisfaction dimensions (economic status, independent living, social interactions, and psychological status); perceived and actual housing, nutrition, and clothing status; and age were continuous variables. Other variables were treated as dummy variables.

...actual housing and actual nutrition (measured by nutrition-related illnesses), race, physical disabilities, and a concern about loneliness were significantly related to all satisfaction dimensions.

[9]Elders who believed their food situation was better than other elders they knew were significantly less concerned about their food situation than those who said their food situation was about the same or worse than that of other elders they knew. Also, elders who said food cost was not an issue were significantly less likely than those who said food cost was a serious issue to believe food was a concern for them.

[10]Elders differed significantly on their concerns regarding their housing situation compared with others they knew, the repairs needed, repair costs, difficulty meeting housing costs, and the amount spent on maintenance and upkeep.

Figure 1. Proposed model of rural Southern elders' satisfaction



Each estimation model used the standard specification:

(1) $Y_i = b_0 + b_1x_{i1} + b_2x_{i2} + ... + b_kx_{ik}$

where

Y	=	the predicted value of the dependent variable
b_0	=	the value of the dependent variable when the independent variables equal 0
$b_1x_{i1} ... b_kx_{ik}$	=	the change in the dependent variable associated with one unit change in each independent variable when other independent variables are held constant

The empirical model for each satisfaction dimension (SATD) was:

(2) $SATD = b_0 + b_1AHOUS + b_2PHOUS + b_3ANCILL + b_4PNDIET + b_5ACLOTH + b_6PCLOTH + b_7AGE + b_8WHITE + b_9TOWN + b_{10}HSCH + b_{11}COLL + b_{12}\$400\text{-}\$699 + b_{13}\$700 + b_{14}ONEHHLD + b_{15}OWNER + b_{16}DISABLE + b_{17}LOCALSER + b_{18}LONELY + b_{19}FEMALE$

where

AHOUS	=	actual housing status
PHOUS	=	perceived housing status
ANCILL	=	actual nutrition status
PNDIET	=	perceived nutrition status
ACLOTH	=	actual clothing status
PCLOTH	=	perceived clothing status
AGE	=	age of elder
WHITE	=	race of elder (the omitted category being "black")
TOWN	=	town in rural county with 50,000 people or less (the omitted category being "rural farm/nonfarm areas")
HSCH	=	1 if education of elder was high school, 0 otherwise
COLL	=	1 if education of elder was college, 0 otherwise (the omitted category being "less than high school")
$400–$699	=	1 if elder's income was $400 to $699
$700	=	1 if elder's income was $700 and above (the omitted category being "less than $400")
ONEHHLD	=	1 if household size was 1, 0 otherwise (the omitted category being "multiperson household")
OWNER	=	1 if elder owned home, 0 otherwise (the omitted category being "renter")
DISABLE	=	1 if elder was disabled, 0 otherwise (the omitted category being "not disabled")
LOCALSER	=	1 if location was a serious concern, 0 otherwise (the omitted category being "not a serious issue")
LONELY	=	1 if loneliness was a concern, 0 otherwise (the omitted category being "not a concern")
FEMALE	=	Gender of elder (the omitted category being "male")

To determine if multicollinearity (correlation $\geq .70$) existed, coefficients were examined. Because marital status and number of people in the household appeared to be highly correlated, marital status was not included in the models.

Data and Sample

This study uses data from the "Quality of Well-Being of the Rural Southern Elderly: Food, Clothing, Shelter" regional research project. The study was funded by The Council of Administrators of Family and Consumer Sciences, the Association of Research Directors, and the U.S. Department of Agriculture's Cooperative State Research, Education, and Extension Service (CSREES). The data set contains information on elders' socioeconomic and demographic characteristics, concerns, health problems, housing status, dietary practices and nutritional status, clothing acquisition and preferences, and life satisfaction.

Cooperating States were Alabama, Arkansas, Georgia, Kentucky, Maryland, Mississippi, Missouri, South Carolina, Tennessee, Texas, and Virginia (fig. 2). To obtain a representative sample of elderly people living in rural counties of the South, the 1980 U.S. Census population tapes were used to determine the total population, the elderly population, and median income by county. Systematic random procedures based on the proportion of elderly population of each county were used to choose six counties (three in South Carolina) from a list of rural counties, that is, those with no more than 30 percent urban population.

Each participating State had 60 sampling units with five elderly households per sampling unit. Using a list of the cumulative number of elderly people

Figure 2. States participating in Quality of Well-Being of the Rural Southern Elderly: Food, Clothing, Shelter regional research project

...women were more likely than men to be satisfied with their ability to live independently...

in each enumeration district, the 60 sampling units were allocated to enumeration districts using sampling intervals of 1/60th of the total elderly population in each of the six counties. Equal probability of selection methods were used to determine sample cluster or sample unit starting points within the six rural counties.

Face-to-face interviews were used to collect data from June 1987 through November 1988. The initial sample consisted of 3,284 people 65 years old and older who were noninstitutionalized, ambulatory, and who lived in rural counties of the South. The sample for this study consisted of 2,951 elderly—those who answered 24 or 25 (the highest possible for this study) items on the life satisfaction scale.[11]

Definition and Treatment of Dependent Variables

The dependent variables were satisfaction related to (1) economic status, (2) independent living, (3) social interactions, and (4) psychological status (see box, p. 32). The satisfaction constructs were introduced accordingly: "I [the interviewer] would like to now focus on how satisfied you are with your life at the present time....tell me if you are" very satisfied (VS=4), satisfied (S=3), dissatisfied (DS=2), or very dissatisfied (VD=1). Each scale was summated.

[11]Eighty-seven percent answered 25 of the life satisfaction items, and 3 percent answered 24 items.

Table 1. Rural Southern elders: Descriptive statistics for continuous variables

Variable	Mean	Standard deviation	Number of components to score	Maximum score	Mean as percentage of potential maximum score
Dependent variables—					
Satisfaction with:					
Economic status	16.58	3.37	6	24	69
Independent living	21.72	3.52	7	28	78
Social interactions	16.27	2.31	5	20	81
Psychological status	21.52	2.67	7	28	77
Independent variables					
Actual housing[1]	49.34	9.69	24	72	69
Perceived housing[2]	2.21	0.94	1	4	55
Actual nutrition[3]	5.00	1.00	4	8	63
Perceived nutrition[4]	20.76	3.60	5	25	83
Actual clothing[5]	5.62	0.99	5	10	56
Perceived clothing[6]	7.87	1.79	6	18	44
Age	73.84	7.34	NA	NA	NA

[1]Access to and condition of selected durable goods and rooms scale.
[2]Home repair needs scale.
[3]Nutrition-related chronic illnesses scale.
[4]Dietary beliefs and practices scale.
[5]Physical conditions affecting clothing selection scale.
[6]Clothing selection and purchases scale.

The *economic status* scale described how satisfied elders were with their present income; life savings; the amount of money available for food, housing, and clothing; and their ability to meet personal and household expenses. The mean score was 16.58 (table 1), and Cronbach's alpha was .91. That is, 91 percent of the variance in the scores on the economic status scale was accounted for by true differences.

The ***independent living*** scale focused on ability to perform some household chores, solve problems, and make decisions. The mean score was 21.72 (Cronbach's alpha = .89). The mean score for ***social interactions*** was 16.27. This dimension measured satisfaction with involvement in religious activities and contact with others. ***Psychological status*** measured satisfaction with time spent alone, life accomplishments, home safety, living arrangements, and adjustment to retirement and retirement age. The mean score was 21.52. Eighty-three to 87 percent of the variance in the scores on the psychological status and social interactions dimensions, respectively, was accounted for by differences in elders' perceptions. Respondents' mean scores, as a percentage of the maximum score that could be obtained, ranged from 83 percent (perceived nutrition) to 44 percent (perceived clothing).

Satisfaction Dimensions

Economic Status

How satisfied are you with your present income?

How satisfied are you with your life savings?

Are you satisfied with your ability to meet personal and household expenses?

How satisfied are you with the amount of money you have to spend for

(a) clothing?
(b) housing?
(c) food?

Independent Living

Are you satisfied with your ability to take care of your household chores?

How satisfied are you with your ability to get around without help from others?

How satisfied are you with your ability to solve your own problems?

Are you satisfied with your ability to make your own decisions?

How satisfied are you with the [sic] ability to

(a) prepare your own meals?
(b) travel?
(c) take care of personal hygiene needs?

Social Interactions

How satisfied are you with the contact you have with

(a) family?
(b) friends?
(c) neighbors?
(d) young people?

How satisfied are you about the extent to which you are involved in religious activities?

Psychological Status

How satisfied are you about spending time alone?

How satisfied are you with your activities since retirement?

How satisfied are you with your life accomplishments?

How satisfied are you with the safety of your home?

How satisfied are you with your living arrangements?

How satisfied are you with adjustments you have made since retirement?

How satisfied are you about reaching retirement age?

Definition and Treatment of Independent Variables

Independent variables were actual and perceived status of housing, nutrition, and clothing, socioeconomic and demographic characteristics, mobility, and elders' concerns about loneliness and location of their home in relation to neighbors and services.

Housing Status

Actual housing consisted of one summated scale: Presence of selected durable goods, condition of durable goods, accessibility of rooms in the home, and condition of rooms. The higher the score, the more likely elders were to have the selected durable goods in working order and accessible rooms in good condition. **Perceived** housing had one summated scale consisting of home repair needs. Elders were asked: "....How would you rate the condition of your present home?"[12] The more repairs believed necessary, the higher the score on this dimension.

Nutrition Status

Nutrition-related illnesses was the **actual** nutrition status measure. Elders were asked if they had diabetes, heart problems, high blood pressure, or atherosclerosis. The higher the score, the more likely elders were to have nutrition-related health problems.

Dietary beliefs about nutritional practices was the **perceived** nutrition status summated scale. Elders stated if they never (1), seldom (2), sometimes (3), almost always (4), or always (5): Believed they ate nutritious meals,

[12]Response choices: No repairs needed, only a few repairs, many minor repairs, or many major repairs needed.

thought what they ate affected how they felt, believed they made an effort to eat the right amount of food, thought they tried to choose the right kinds of foods to eat, and believed what they ate would affect their health. Higher scores indicated elders' beliefs about their nutritional status were positive.

Clothing Status

To describe **actual** clothing status, physical conditions that affect clothing selection were used in a summated scale. Elders were asked if arthritis/rheumatism, humpback, swayback, enlarged waist or abdomen affected the type of clothing selected. The more conditions reported, the higher the score. The **perceived** clothing status scale measured elders' beliefs about clothing purchases and selection. They indicated if they purchased age-appropriate and easy-on/easy-off clothing, if their budget was adequate for purchasing needed clothes, and if they were able to find styles that were suitable for their figure type. The higher the score, the more positive elders felt about clothing selections.

Results

Characteristics of Elders

Most were White, female, had less than a high school education, and were not physically disabled. Also, most owned their home and believed the location of their home was not a serious issue. A majority of the elders lived in rural farm/nonfarm areas, lived with their spouse or others, had a monthly income over $400, and thought loneliness was a serious concern (table 2).

Table 2. Rural Southern elders: Descriptive statistics for categorical variables

Variables	n	Percent
Gender		
Female	2,323	79
Male	622	21
Race		
White	2,339	79
Black	608	21
Rural county residence		
Farm/nonfarm	1,729	59
Town	1,214	41
Education		
Less than high school	1,987	67
High school or technical/trade	573	20
College	378	13
Respondent's monthly income		
<$400	1,379	48
$400-$699	897	32
$700+	581	20
Household size		
One	1,327	45
Two or more	1,594	55
Housing tenure		
Owner	2,471	84
Renter	474	16
Home's location is serious concern		
Yes	825	28
No	2,101	72
Loneliness is a serious issue		
Yes	1,599	55
No	1,317	45
Physically disabled		
Yes	469	16
No	2,482	84

Table 3. Rural Southern elders' satisfaction: Ordinary least squares regression results

Variables	Satisfaction with			
	Economic status	Independent living	Social interactions	Psychological status
Actual housing[1]	.154**	.153**	.174**	.185**
Perceived housing[2]	–.186**	–.043*	.005	–.070**
Actual nutrition[3]	–.086**	–.151**	–.084**	–.069**
Perceived nutrition[4]	.010	.096**	.082**	.078**
Actual clothing[5]	–.039*	–.078**	–.002	.077**
Perceived clothing[6]	–.174**	–.053**	–.022	–.101**
White (Black)	.145**	–.070**	–.099**	–.072**
Age	.119**	–.111**	–.006	.033
One-person household (Multiperson household)	–.008	–.095**	–.076**	–.004
Female (male)	.025	.035*	.039*	.041*
Town (farm/nonfarm)	–.046**	–.006	–.081**	–.009
High school[7] (Less than high school)	.041*	.036*	.070**	.026
College[7]	.048**	.022	.021	.040*
$400-$699 (<$400)[8]	.005	–.005	.013	.010
$700[8]	.120**	.012	.006	.066**
Owner (Renter)	.074**	.027	–.010	.020
Location is serious concern (Not serious)	–.017	.005	–.050*	–.018
Loneliness is a concern (Not a concern)	–.070**	–.144**	–.099**	–.173**
Disabled (Not disabled)	–.036*	–.259**	–.118**	–.083**
$\bar{R}^2$	.29	.27	.11	.19
F ratio	62.71**	56.71**	18.88**	36.58**

[1]Access to and condition of selected durable goods and rooms scale.
[2]Home repair needs scale.
[3]Nutrition-related chronic illnesses scale.
[4]Dietary beliefs and practices scale.
[5]Physical conditions affecting clothing selection scale.
[6]Clothing selection and purchases scale.
[7]High school is 12th grade or technical/trade school. College is 1 or more years.
[8]Respondent's monthly income.
* $p \leq .05$.
** $p \leq .01$.

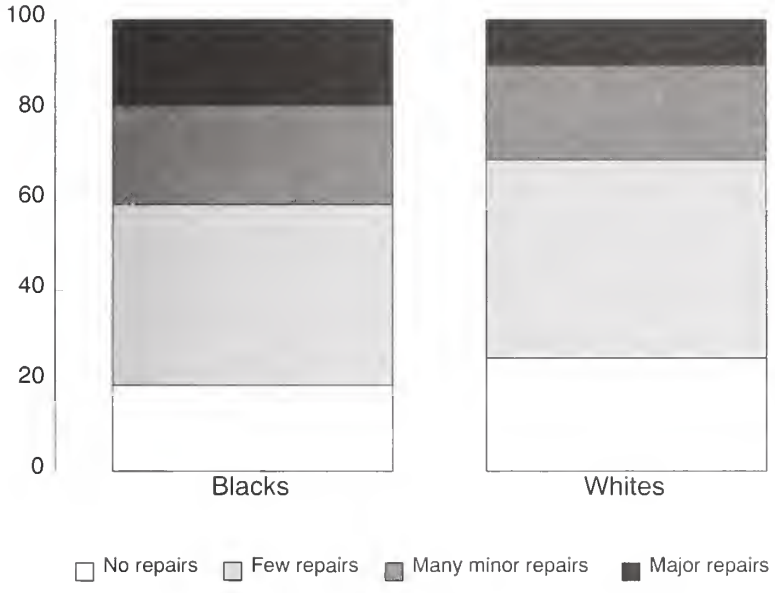
Satisfaction Related to Actual and Perceived Status

Results reveal that when other variables were controlled, rural Southern elders who were pleased with their actual housing status were significantly more likely than those who were not pleased to be satisfied across all dimensions—economic status, independent living, social interactions, and psychological status (table 3). Elders whose homes needed repair were significantly less satisfied with their economic status, ability to live independently, and psychological status. Additional analysis shows that 41 percent of Black elders and 31 percent of White elders said they had major or many minor home repair needs (fig. 3). The presence of nutrient-related illnesses was negatively related to all satisfaction dimensions.

Elders who believed there was a connection between food-related behavior and health were significantly more likely than those who believed otherwise to be satisfied with their ability to live independently, their social interactions, and their psychological status. Figure 4 shows that between 84 and 73 percent of the rural Southern elders had positive beliefs and practices related to nutrition. However, compared with other beliefs and practices, a larger percentage of elders never or seldom believed what they consumed affected their health (14 percent).

The more physical conditions elders had that affected actual clothing status, the more likely rural Southern elders were to indicate significant dissatisfaction with their economic status and independent living and significant satisfaction with their psychological status. Elders who were more positive about their perceived clothing status were significantly less satisfied with their

Figure 3. Actual housing status: Home repair needs of rural Southern elders by race, 1986*



*Significantly different at $p \leq .01$.

Elders whose homes needed repair were significantly less satisfied with their economic status, ability to live independently, and psychological status.

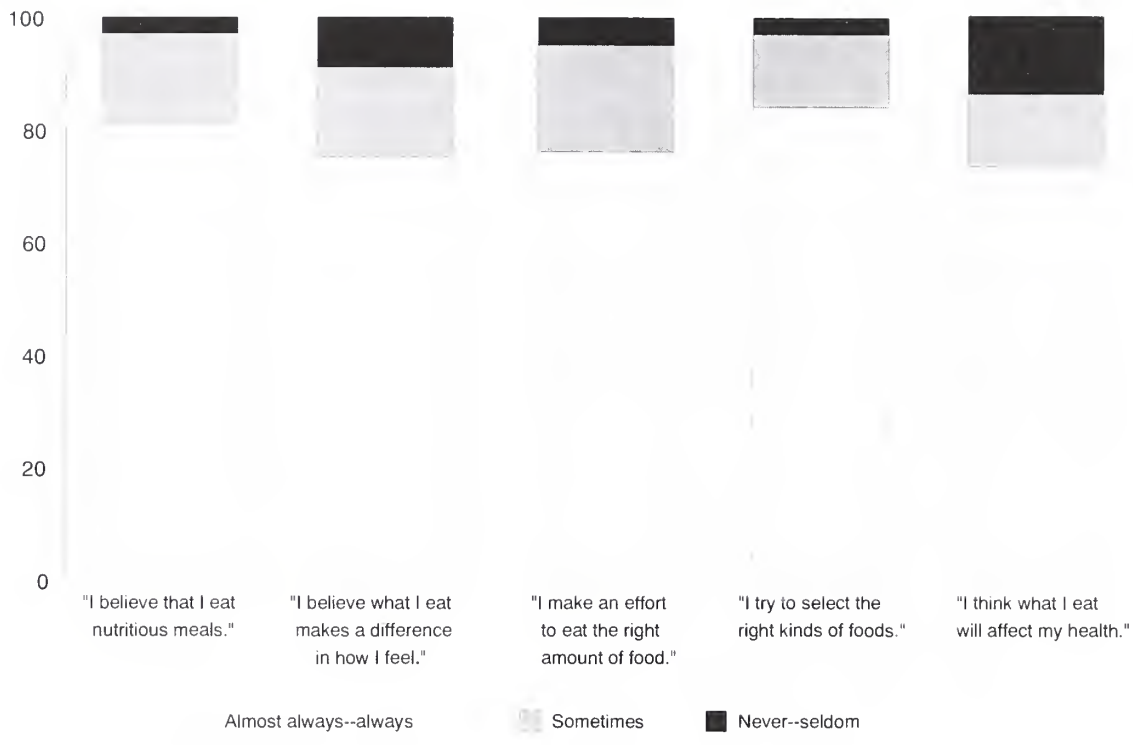
perceived economic, independent living, and psychological status compared with elders who were less positive. Results related to perceived clothing status appear counter-intuitive.

Satisfaction Related to Socioeconomic and Demographic Characteristics

Race was significantly related to all satisfaction dimensions, when other factors were controlled. Compared with Black elders, White elders were significantly more likely to be satisfied with their economic status and less likely to be satisfied with their ability to live independently, social interactions, and psychological status.

As elders aged, they were significantly more likely to be satisfied with their economic status and less satisfied with their ability to live independently. As people age, the likelihood of living alone increases. Census data show that in 1993, 14 percent of people 55 to 64 years old, 24 percent of those 65 to 74 years old, and 40 percent of those 75 years old and older lived alone *(27)*. Living alone significantly influences some areas of satisfaction among the rural Southern elderly. One-person households were less likely than other households to be satisfied with their ability to live independently as well as less satisfied with their social interactions.

Figure 4. Perceived nutritional status: Elders' beliefs, 1986



Among those 65 years and older, women are more likely than men to live in one-person households. Census data indicate that 32 percent of women 65 to 74 years old live alone compared with 13 percent of men in this age group. Among women 75 years and older, 52 percent lived alone versus 20 percent of men. Rural Southern elderly women were more likely than the men to be satisfied with their ability to live independently, with their social interactions, and with their psychological status.

Elders in rural towns were significantly less likely than elders in rural farm/nonfarm areas to be satisfied with their economic status and social interactions.

Compared with elders with less than a high school education, those with a high school or technical education were significantly more satisfied with their economic situation, ability to live independently, and social interactions.

Those with a college education were significantly more likely to be pleased with their economic and psychological status but no more likely to be pleased with other aspects of their life, compared with elders with less than a high school education.

For the rural Southern elderly, income was not a strong predictor of satisfaction. Two significant relationships existed, when all other variables were controlled.

Compared with those whose personal income was less than $400 per month, those whose personal income was $700 or more per month were more satisfied with their economic and psychological status.

Home ownership for the elderly often means that the housing unit is not mortgaged. Elderly homeowners can allocate more of their fixed income to nonhousing expenditure categories than can elderly renters. Compared with renters, homeowners were significantly more likely to be satisfied with their economic status.

Satisfaction Related to Mobility and Concerns

Rural Southern elders who were physically disabled and those who were lonely were significantly less likely than others to be satisfied with their economic status, ability to live independently, social interactions, and psychological status. Also, elders who believed the location of their home was a serious concern were significantly less satisfied with social interactions than were those who believed location was not a concern.

Conclusions and Implications

Results support the need to address most of the 1995 White House Conference on Aging proposed agenda items: Health and health care, long-term care, social and community-based services, housing, financial security, and community involvement *(25)*. Other studies from the regional project "Quality of Well-Being of the Rural Southern Elderly: Food, Clothing, Shelter" focused on actual or perceived status or provided descriptive information. This study provides a more comprehensive framework on elders' well-being, as measured by their satisfaction with different areas of life. Follow-up studies may concern the effectiveness of intervention strategies that could influence rural Southern elders' satisfaction with life.

This study focuses on rural Southern elders' well-being as measured by their satisfaction across several dimensions and includes objective and subjective evaluations of their housing, nutrition, and clothing status. Findings show that, overall, rural Southern elders' satisfaction with their economic status, independent living status, social interactions, and psychological status is a multidimensional construct that is significantly affected by some perceived and actual housing, nutrition, and clothing status variables as well as socioeconomic and demographic characteristics, mobility, and concerns. With all other variables controlled, actual housing and actual nutrition (measured by nutrition-related illnesses), race, physical disabilities, and a concern about loneliness were significantly related to all satisfaction dimensions. Income, concern about location, and housing tenure were less likely than other variables to predict satisfaction.

For the elderly, housing has various connotations beyond shelter and economics. These include independence—being able to take care of household chores and personal needs without assistance from others, living arrangements, and safety.

Nutrition-related health problems influence life satisfaction of the rural Southern elderly. Having a diet-related chronic illness affects all areas of life satisfaction. These findings suggest dietary intake, health status, and life satisfaction may be included in a framework for examining food-related behavioral changes in this population.

Also, although the elderly spend a smaller percentage of their total expenditure on clothing compared with younger cohorts, proper fit, costs, and styles remain important factors. Additional research needs to be done to explore why elders who were satisfied with clothing selections were less satisfied with their economic and psychological status and ability to live independently.

Race, age, and household type can help determine the types of services needed by rural Southern elders. Policies that address elders' well-being need to focus on issues related to living in one-person households, adapting the environment to accommodate elders' changing physical conditions, and extending elders' contact with others. Age should be considered when professionals are determining the adequacy of elders' income and issues related to independent living. Elders tend to become more satisfied with their economic status as they age, more concerned about their ability to live independently, and they are likely to live in one-person households at some point.

Living independently requires preretirees to make decisions about retirement earlier rather than later in life, and elders need to consider interventions, such as the development of a strong social network, at an earlier age. Also, the varied needs of the physically handicapped elder should be addressed to foster independent living and social interactions.

Policies that focus on meeting the needs of rural Southern elders must be multifaceted. To address elders' economic status without considering other aspects of living leaves them vulnerable to other factors that may reduce their perceptions of well-being.

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Cholesterol Measurement

Elevated levels of serum blood cholesterol have been shown to be positively correlated with increased rates of coronary heart disease, a leading cause of death for both men and women in the United States. There were 478,530 deaths attributed to coronary heart disease in 1991, according to the American Heart Association. In addition, 1.5 million Americans were expected to suffer a heart attack in 1994. Total costs associated with coronary heart disease are estimated to be $56.3 billion per year—$37.2 billion spent on hospital and nursing home services, $8.7 billion on physicians and nurses services, $2.4 billion on drugs, and $8 billion in lost output.

Because of the large sums being spent on treatment of coronary heart disease, prevention has been emphasized. In 1985, the National Institutes of Health (NIH) founded the National Cholesterol Education Program (NCEP) to encourage Americans to have their cholesterol measured and to modify their diets. Related to the NCEP, the U.S. General Accounting Office was asked to review and evaluate: How cholesterol is measured, the accuracy and precision of cholesterol measurement techniques, what factors influence cholesterol levels, and the potential effect of uncertain measurement.

The NCEP defines an adult's risk status according to serum cholesterol levels, including total, high-density lipoprotein (HDL), and low-density lipoprotein (LDL), in conjunction with other coronary heart disease risk factors. Cholesterol levels are classified as: Desirable (below 200 mg/dL), borderline high (200-239 mg/dL), and high (240 mg/dL or above). Accurate cholesterol test results are needed to provide clinical guidelines for identifying and treating people who are particularly at high risk of heart disease. Positive risk factors are:

- Hypertension (140/90 mm Hg or higher, or on antihypertensive medication)
- Current cigarette smoker
- Diabetes
- Family history of myocardial infarction or sudden death before age 55 in father or male sibling, before age 65 in mother or female sibling
- Age: male 45 years or over or female 55 years or over or postmenopausal and not on estrogen replacement therapy
- Low HDL cholesterol (less than 35 mg/dL)

The treatment goal is to reduce LDL cholesterol, first with diet and then with cholesterol-lowering drugs if diet is not successful. The average total serum cholesterol for adults is about 205 mg/dL, which is slightly above NCEP's borderline-high category. Of the adult population, 52 million people (29 percent) are candidates for dietary therapy. Of this group, 12.7 million (7 percent of the adult population) are candidates for drug therapy, often for life.

An NCEP panel of experts in 1988 found considerable inaccuracy in cholesterol testing in the United States. They and a subsequent panel in 1990 made recommendations about how cholesterol measurement could be standardized and improved. They recommended that two separate

cholesterol measurements be averaged together, with further testing if the first two varied substantially. The panels also established the goal that by 1992 a single total cholesterol measurement should be accurate within +/- 8.9 percent. The Health Care Financing Administration (HCFA) also established testing requirements for total cholesterol (+/- 10 percent) and HDL cholesterol (+/- 30 percent).

Nearly two-thirds of American adults have had a cholesterol test in the past 5 years and thus know their cholesterol number. However, cholesterol levels should be viewed as a range rather than as an absolute fixed number. Individuals and physicians should be aware of cholesterol measurement variability; decisions to classify patients and begin treatment need to be based on the average of multiple measurements and the assessment of other risk factors.

Under controlled conditions, particularly research, clinical, and hospital laboratories, cholesterol measurement is reasonably accurate and precise. Less is known about the performance of cholesterol measurement in other settings, such as physician's offices, commercial laboratories, and mass public health screenings.

Over 40 manufacturers have about 160 devices on the market that use different technologies and chemical formulations to conduct cholesterol tests, making it difficult to standardize measurement. Under the Clinical Laboratory Improvement Amendments of 1988, HCFA is conducting laboratory inspections to assess quality control procedures and test results on all medical equipment, including cholesterol testing. Studies of desk-top analyzers have found accuracy problems for total and HDL measurements, with misclassification rates for some devices ranging from 17 to nearly 50 percent.

Biological and behavioral factors such as diet, exercise, and illness cause an individual's cholesterol level to vary, accounting for up to 65 percent of total variation. The average biological variation of total cholesterol is 6.1 percent; HDL cholesterol, 7.4 percent; and LDL cholesterol, 9.5 percent. Biological variation is caused by behavioral factors such as diet, exercise, and alcohol consumption, and clinical factors such as illness, medications, and pregnancy. Changes in the consumption of saturated fats and cholesterol raise or lower serum cholesterol levels, although individuals tend to respond quite differently to changes in diet.

Recent studies have found that differences in the way blood samples are collected and handled can have different results. Capillary (finger-stick) samples were found to be more variable than venous samples—an important finding since capillary samples are taken in screening settings and are used in recently FDA-approved and marketed home test kits.

The total error in cholesterol testing measurement associated with analytical and biological variability can have important consequences. If the total error is assumed to be 16 percent (equivalent to the sum of the NCEP goal for analytical variability plus the average biological variability derived from a synthesis of existing studies), then a single measurement of total cholesterol known to be 240 mg/dL could be expected to range from 201 to 279 mg/dL, and a single measurement of HDL cholesterol known to be 35 mg/dL could range from 24 to 46 mg/dL.

Important consequences can be associated with measurement error. In a worst-case scenario, two types of diagnostic errors could occur: false-positive or false-negative results. A false-positive screen could result in treating someone who in fact has a desirable total, HDL, or LDL cholesterol level. A false-negative would incorrectly reassure someone that his or her cholesterol level is low. The likelihood of such errors occurring is greatest if physicians rely on only one cholesterol measurement in making treatment decisions. The most recent NCEP Adult Treatment Panel recommends that a second test be done when an initial measurement shows total cholesterol to be over 200 mg/dL and HDL to be under 35 mg/dL. Some researchers recommend that as many as four HDL and LDL cholesterol tests be done before making treatment decisions.

Source: U.S. General Accounting Office, 1994, *Cholesterol Measurement: Test Accuracy and Factors that Influence Cholesterol Levels.* Report to the Chairman, Subcommittee on Investigations and Oversight, Committee on Science, Space, and Technology, House of Representatives, GAO/PEMD-95-8.

The Effects of Health Insurance on Consumer Spending

Health care expenditures in the United States are consuming an ever-increasing portion of gross domestic product (GDP). In 1993, the Nation's health care costs accounted for 13.9 percent of the GDP, compared with 5.9 percent in 1965 when medicare and medicaid were initiated.

As reliance on the health care system and the cost of health care have risen, responsibility for funding health care has shifted. In 1965, 50 percent of health services and supplies were paid for by household out-of-pocket spending. By 1993, the amount dropped to 18 percent.

Much of the direct cost of funding health care has shifted to business and government. The private business share of health services and supplies grew from 16 percent in 1965 to 28 percent in 1981 but has since remained fairly constant. The Federal Government's share has continued to grow—increasing an average 12.2 percent per year over the 1989-93 period. In 1993, the Federal Government was responsible for 31.7 percent of the Nation's health care bill.

Households are likely to contribute more to fund health care in the future. This article uses Consumer Expenditure Survey data to report expenditures for four different groups of households: The fully insured, the partially insured, medicaid recipients, and the uninsured. Demographic characteristics, expenditure shares, regression results, and income elasticities are examined. The data show clear differences in consumer spending patterns among groups, depending on insurance coverage; differences are not limited to health care expenditures.

Past Trends

In the 1960-91 period, 57 percent of health care expenditure increases could be attributed to rising prices. Population growth accounted for 10 percent, and intensity of use (changes in use or in the type of services and supplies) was responsible for the remaining 33 percent.

Medicare and medicaid made up 70 percent of all public funding for health care in 1993. CE survey data show that about 9 percent of U.S. households participate in the medicaid program.

The cost of health care paid by employers has increased steadily since the mid-sixties. As a result, businesses have tried various methods of cost containment, while still providing health insurance as a benefit. For example, the deductible: in 1980, 8 percent of full-time workers in medium and large firms who participated in employer-sponsored health insurance plans had a deductible greater than $100. By 1993, 54 percent of such workers had deductibles greater than $100 and 25 percent had deductibles of $250 or more.

Also, participation in health maintenance organization-type plans was encouraged. According to the CE, the percentage of families that reported health insurance expenditures rose from 55 percent in 1988 to 61 percent in 1993. Also, the survey showed that insurance premiums increased from a 39-percent share of health care expenses in 1988 to a 45-percent share in 1993.

Fully insured—includes families in which the sum of the members covered by each insurance policy (or medicare) is equal to, or greater than, the number of family members.

Partially insured—includes families in which the number of members covered by health insurance policies is less than the total number of family members.

Medicaid recipients—includes families in which at least one member is receiving medicaid, regardless of what other policies they may have. Although some family members may not be covered by medicaid, the entire family is placed in the medicaid group.

Uninsured—includes families who reported that they did not have a policy, or that they had a policy that covered only someone outside the consumer unit (such as a child at school), or that they had a policy with limited coverage; for example, only dental coverage, or only children injured in school-related athletic activities.

Table 1. Selected characteristics of families by insurance status, 1993 Consumer Expenditure Survey

Item	All consumer units	Insurance status			
		Fully covered	Partially covered	Medicaid	Not covered
Sample size	20,877	13,394	2,399	1,793	3,291
Age of reference person	47.8	51.4	45.0	45.0	37.0
Annual income before taxes[1]	$29,872	$33,603	$34,770	$13,041	$21,294
Average number per consumer unit					
Persons	2.5	2.2	3.5	3.2	2.5
Earners	1.3	1.3	2.0	.8	1.4
Children under 18 years	.7	.5	1.0	1.4	.8
		Percent distribution			
Age of reference person					
Under 25	8	4	7	14	19
25 - 34	20	18	20	25	28
35 - 64	50	49	62	42	51
65 - 74	12	16	8	10	1
75 and above	10	14	4	9	1
Income distribution by quintile[1]					
1st quintile	20	14	10	55	31
2nd quintile	20	18	16	26	25
3rd qunitile	20	21	23	11	20
4th quintile	20	23	27	5	13
5th qunitile	20	24	23	3	11
Ethnicity of reference person					
Black	10	7	12	26	13
Hispanic origin	7	4	10	17	13
White and other	83	90	78	57	74
Education of reference person					
Less than high school diploma	22	18	22	50	24
High school graduate or some college	54	54	60	46	58
College graduate	23	28	18	4	18
Composition of consumer unit					
Husband/wife only	21	28	10	6	10
Husband-wife with children	27	26	36	18	28
Single parent	7	4	7	26	9
Single person	29	33	0	20	37
Other	16	8	47	30	16
Occupation of reference person					
Wage and salary earner	64	63	77	37	76
Professional, managerial, supervisor	23	27	25	4	18
Technical, sales, clerical	15	15	19	8	15
Service	7	5	8	8	15
Blue collar and other	19	16	25	17	28
Self-employed	7	7	6	3	8
Retired	18	24	10	14	3
Out of labor force (includes unemployed)	11	5	7	47	13

Note: Data may not add to 100 percent due to rounding.
[1] Data are for complete income reporters only.

Demographic Characteristics

Selected characteristics of families by health insurance status for all families[1] are shown in table 1.

The fully insured. About two-thirds of all families have full insurance coverage. This group has, on average, the oldest reference person, the fewest family members under age 18, and the smallest family size. This group includes lower percentages of Blacks and Hispanics and unemployed reference persons; and higher percentages of college graduates, retirees, and residents living in the Northeast than does the general population. Typical families with full health insurance coverage are married couples with higher than average income and a reference person employed in a professional, managerial, or supervisory position.

The partially insured. About 11 percent of families have partial coverage. On average, this group has the largest family size, the most earners per family, and higher than average income. A majority (62 percent) of reference persons are between 35 and 64 years old, and 60 percent have a high school diploma or some college education. Most are married couples with children or "other families." They are as likely to work in professional, managerial, or supervisory positions as in blue-collar occupations.

Medicaid recipients. This group included about 9 percent of families. On average, medicaid families have fewer earners and more children per family than families in the other groups. As expected, this group has lower than average income, and about half of these families have a reference person who has not graduated from high school or who is unemployed or out of the labor force for reasons other than retirement. The percentage of Blacks and Hispanics in this group is substantially higher than in the population as a whole. Also, a greater proportion of single-parent families participate in the medicaid program than do married couples.

The uninsured. About 16 percent of all families are uninsured. This group has the highest proportion of single persons and blue-collar workers. The uninsured are the youngest families, with lower than average income, and they are more likely to live in the South.

Expenditure Shares

In 1993, total expenditures of the partially and fully insured groups were about $8,000 higher than those of the uninsured group and about $16,000 higher than those in the medicaid group. Among the four groups, the fully insured allocate the smallest expenditure share (10.5 percent) to food at home; the medicaid group allocated 20.6 percent (table 2). Housing accounted for the largest expenditure share for all insurance groups. For the fully insured, shares for transportation, other expenditures, and recreational goods followed.

The partially insured group allocated similarly, but with slightly larger shares allocated to food at home and transportation, reflecting their larger number of family members and earners. Also, the expenditure share for recreation was slightly lower than for the fully insured.

The medicaid group spent larger shares for housing (37 percent) and food at home (21 percent) than did any other group. Other commodity shares are substantially lower for medicaid families.

The expenditure shares of the uninsured group have a pattern similar to those shares for families that are fully or partially insured. The education share for the uninsured was greater than that for the other groups, reflecting the greater proportion of single and younger persons in the uninsured group.

The expenditure shares for two items—apparel and services and personal care—are very similar for all groups. This indicates that spending changes across groups for these items are proportionate to changes in total expenditures.

Health care spending. Fully insured families allocate the largest share of total expenditures to health care (7 percent). Partially insured families spend less for health insurance and a smaller share of total expenditures (5 percent) for health care. The medicaid group allocated 4 percent and the uninsured, 3 percent for health care. The uninsured are typically younger—so may, on average, be in better health than members of other groups. Also, because they are younger, they may be less risk averse, and they may hold entry-level jobs that limit access to employer-sponsored health insurance.

The fully insured spend half of their health care dollars for insurance premium payments; 33 percent is spent on medical services and 17 percent, on prescription drugs. Families with partial coverage allocate a smaller share (43 percent) to insurance and a larger portion to medical services (41 percent). Those on medicaid, though spending on health care is only 26 percent as much as that of the fully insured, also spend about half (52 percent) on insurance premiums; medicaid recipients allocate only 28 percent of their health care expenditure to medical services.

[1]The data used in this article are weighted to represent the U.S. population.

Table 2. Average annual expenditures and budget shares, 1993 Consumer Expenditure Survey data

Type of expenditure	All consumer units	Insurance status			
		Fully covered	Partially covered	Medicaid	Not covered
Total expenditures	$27,769	$30,372	$31,008	$14,976	$22,492
		Expenditure shares (percent)			
Food at home	11.6	10.5	12.6	20.6	12.9
Housing (minus other lodging)	30.6	30.0	29.9	36.9	32.3
Apparel and services	4.6	4.6	4.7	4.9	4.7
Transportation (minus trips)	18.3	18.0	20.1	16.4	18.5
Health care	5.9	6.8	5.3	3.6	2.9
Health insurance	2.9	3.4	2.3	1.9	.8
Medical services	2.1	2.2	2.2	1.0	1.6
Prescription drugs and medical supplies	1.0	1.1	.8	.8	.6
Personal care	.9	.9	.9	.9	.8
Tobacco and alcohol	1.8	1.6	2.0	2.8	2.5
Recreation and related	12.2	12.9	10.7	7.4	11.7
Food away from home	4.2	4.4	3.9	2.4	4.4
Other lodging	1.3	1.5	1.1	.3	.9
Transportation for trips	.9	1.1	.6	.4	.8
Entertainment	5.1	5.3	4.6	3.9	5.1
Reading material	.6	.6	.5	.4	.5
Other expenditures	14.0	14.6	13.9	6.6	13.8
Education	1.5	1.3	1.4	.5	2.5
Miscellaneous	1.4	1.5	1.2	1.0	1.3
Cash contributions	.8	1.0	.7	.4	.6
Personal insurance and pensions	10.3	10.8	10.6	4.7	9.3

In contrast, 55 percent of medical expenses of the uninsured are for medical services.

Regression Analysis

Regressions to estimate relationships of major expenditure categories to family characteristics were undertaken. Specifically, dependent variables were: Food at home, housing, apparel and services, transportation, and recreation and related expenditures. Health care expenditures were omitted because of data limitations in the CE.

Each insurance group had a positive statistically significant coefficient for permanent income and food at home. This indicates that given an increase of $1 in permanent income, all families are predicted to increase their food-at-home expenditures. Fully insured families would increase food-at-home expenditures by 6 cents; partially insured, by 7 cents; the uninsured, by 8 cents; and medicaid families, by 12 cents.

The relationship between housing expenditures (less other housing) and permanent income differs little across insurance groups, at least for families with mortgages. All families were predicted to spend about 28 cents of every additional dollar on housing—except for uninsured families who would spend 31 cents. When the mortgage is paid off, housing expenditures as a share of an additional dollar decline. Renters have different patterns. Fully insured renters would spend about 32 cents of each additional dollar on housing; partially insured would spend 27 cents; medicaid families who rent would spend 42 cents; and the uninsured

Table 3. Income elasticities for selected expenditure categories, Consumer Expenditure Survey data, 1993

Type of expenditure	Insurance status			
	Fully covered	Partially covered	Medicaid	Not covered
Food at home	0.58	0.59	0.60	0.65
Housing (less other lodging)	.95	.93	.78	.98
Apparel and services	1.07	1.19	1.14	1.06
Transportation (less trips)	1.03	1.13	1.01	.91
Recreation and related expenditures	1.12	1.15	1.20	1.21

renters are not significantly different from fully insured renters.

For apparel and services, the increase in expenditures, given an additional dollar of income, is similar regardless of insurance status. All groups were predicted to spend between 5 and 6 cents of each additional dollar for apparel and services.

Transportation (less trips) was found to be strongly related to income, regardless of insurance group. Partially insured families would spend nearly 23 cents of an additional dollar on transportation, followed by the fully insured (18 cents), the uninsured, and medicaid families (17 cents each). For all groups, spending on transportation is predicted to decrease as the reference person grows older. Ownership of each additional automobile adds about $90 to quarterly expenditures—except for medicaid families, who would spend about $132 more per vehicle per quarter.

Recreation and related expenditures consumed about 14 cents of every additional dollar for the fully insured, compared with 12 cents for the partially insured and 9 cents for those on medicaid. The uninsured would spend similarly with the fully insured.

Income Elasticities

An elasticity can be described as the percent change in one factor given a 1-percent increase in another factor. If the income elasticity of a good or service is less than one, it is called inelastic. If it is greater than one, it is called elastic. Expenditures with an income elasticity that is positive, but less than one, are often called necessities; those with a positive income elasticity that is greater than one are often called luxuries.

Income elasticities did not vary greatly across insurance groups for most items (table 3). The least elastic good was food at home, followed by housing, and transportation. Uninsured families were the only group for which transportation was inelastic. Also, housing was more inelastic for medicaid families than for other families—probably because average income was lower.

Conclusions

The analysis indicates that consumer spending patterns clearly differ with the health insurance status of families and that the spending patterns are not limited to differences in health care expenditures. Also, the analysis suggests that changes in the portion of health care costs that consumers pay out-of-pocket would be tied to changes in other expenditures.

Source: Paulin, G.D. and Weber, W.D.,1995, The effects of health insurance on consumer spending, *Monthly Labor Review* 118(3):34-54.

Would you like to publish in *Family Economics and Nutrition Review?*

Family Economics and Nutrition Review will consider for publication articles concerning economic and nutritional issues related to the health and well-being of families. We are especially interested in studies about U.S. population groups at risk—from either an economic or nutritional perspective. Research may be based on primary or secondary data as long as it is national or regional in scope or of national policy interest, and articles may use descriptive or econometric techniques. Manuscripts may be mailed to: Joan C. Courtless, Editor, Center for Nutrition Policy and Promotion. See page 62 for guidelines and complete address.

Measuring Years of Healthy Life

Increasing the span of healthy life for Americans is one of the three broad goals of *Healthy People 2000*. The years of healthy life measure has been selected for monitoring progress toward this goal.

Historically, health has been measured in terms of mortality (infant mortality, life expectancy, age-specific and disease-specific death rates) and morbidity (disability days and prevalence of chronic conditions). Measures of mortality may understate the public health importance of chronic disability, and measures of morbidity may underestimate social and mental dysfunction as well as satisfaction with health. Also, these traditional indicators do not provide summary information on a population's health status.

A single measure that incorporates health-related quality of life and life expectancy gives a more comprehensive picture of the population's health. This summary measure would help monitor the Nation's health, identify health priorities, and evaluate and compare the effectiveness of different interventions.

Defining Years of Healthy Life

The years of healthy life measure uses a life expectancy model in which standard life table data are adjusted by the health-related quality of life of a population. Combining measures of different concepts of health into a single number requires a conceptual model that considers health as a continuum ranging from perfect health (1.0) to death (0.0).

Between these two points are a number of discrete health states, defined in terms of one or more concepts of health-related quality of life. For instance, when perceived health and activity limitation are selected concepts, each health state is indicated by two dimensions—that is, a person may be in good health but unable to perform his or her major activity, such as going to work or school.

Health states are assigned numbers that represent the values that either society as a whole or individuals place on being in each health state. These numerical values can be used to summarize the health of an individual or group of individuals. For example, a health state value of 0.75 represents 75 percent of full function. Measures of years of healthy life are obtained when the values representing states along the health continuum are used to modify duration of life.

To monitor progress toward the overall goal in *Healthy People 2000*, it was necessary to develop a measure of healthy life using data that were collected in 1990 and would be available each year until 2000. Therefore, data from the National Health Interview Survey (NHIS) were used because certain questions are to be repeated each year between 1990 and 2000. Among the health characteristics measured annually are activity limitation and perceived health. For the *Healthy People 2000* measure of health-related quality of life, each person is classified into one of six categories based on age and ability to perform a major activity:

- not limited in any way
- not limited in major activity but limited in other activities
- limited in major activity
- unable to perform major activity
- unable to perform instrumental activities of daily living (IADL) without the help of other persons
- unable to perform self-care activities of daily living (ADL) without the help of other persons.

Each NHIS respondent is asked to describe his or her health status as excellent, very good, good, fair, or poor. The response to the question about perceived health status is used to form a matrix with the six categories of activity limitation. This matrix yields an operational definition of health-related quality of life consisting of 30 possible health states, ranging from the optimal level of not limited in activity and in excellent health to the lowest health state of needing help to perform self-care activities of daily living and being in poor health. The percentage of people in each of these health states is shown in table 1, p. 48. In 1990, almost 83 percent of the civilian noninstitutionalized U.S. population had no role limitation and were perceived to be in excellent, very good, and good health.

Values were assigned to each of the 30 cells in the matrix defined by perceived health and role limitation. Values range from 1.00 for persons who have no role limitation and are in excellent health to 0.10 for persons who are limited in ADL and are in poor health (table 2, p. 48).

To estimate health-related quality of life for a population, the number of people in and the score for each health state and the ages of the people in the population need to be determined. Results from the 1990 NHIS estimate

Table 1. Percent of persons in the civilian noninstitutionalized U.S. population, by health state defined in terms of activity limitation and perceived health status: National Health Interview Survey, 1990

Activity limitation	Perceived health status				
	Excellent	Very good	Good	Fair	Poor
Not limited	38.1	26.3	18.2	3.3	0.3
Limited-other	0.6	1.1	1.8	1.3	0.4
Limited-major	0.5	0.7	1.3	0.7	0.2
Unable-major	0.1	0.2	0.5	0.6	0.5
Limited in IADL[1]	0.1	0.2	0.5	0.6	0.6
Limited in ADL[2]	<0.1	0.1	0.2	0.3	0.5

[1]IADL is instrumental activities of daily living.
[2]ADL is activities of daily living.

Source: National Health Interview Survey, Centers for Disease Control and Prevention, National Center for Health Statistics.

Table 2. Values for health states defined in terms of activity limitation and perceived health status: National Health Interview Survey, 1990

Activity limitation	Perceived health status				
	Excellent	Very good	Good	Fair	Poor
Not limited	1.00	0.92	0.84	0.63	0.47
Limited-other	0.87	0.79	0.72	0.52	0.38
Limited-major	0.81	0.74	0.67	0.48	0.34
Unable-major	0.68	0.62	0.55	0.38	0.25
Limited in IADL[1]	0.57	0.51	0.45	0.29	0.17
Limited in ADL[2]	0.47	0.41	0.36	0.21	0.10

[1]IADL is instrumental activities of daily living.
[2]ADL is activities of daily living.

Source: National Health Interview Survey, Centers for Disease Control and Prevention, National Center for Health Statistics.

that people age 45-50 years had an average health-related quality of life that is 86 percent of full health; people age 65-70 years had an average score of 76 percent of full health (table 3).

To calculate years of healthy life, two sets of data—an abridged life table and age-specific estimates of health-related quality of life of the U.S. population—are combined. Both sets of data represent cross-sectional data for a given year and represent the experience of a hypothetical cohort, not that of any actual population over the lifetime of all its members.

In 1990, the life expectancy at birth for the total population was 75.4 years and the corresponding number of years of healthy life was 64.0 years (table 3). This means that people born in 1990 can expect to experience an average of 85 percent of full function over their lifetimes, assuming that the mortality

Table 3. Calculation of years of healthy life: Total U.S. population, 1990

Age interval (years)	Average health-related quality of life of persons in the age interval	Years of healthy life remaining	Life years remaining
0 - 5	0.94	64.0	75.4
5 - 10	0.93	60.1	75.1
10 - 15	0.93	55.5	71.2
15 - 20	0.92	50.9	66.3
20 - 25	0.91	46.5	61.3
25 - 30	0.91	42.2	56.6
30 - 35	0.90	37.9	51.9
35 - 40	0.89	33.7	47.2
40 - 45	0.88	29.5	42.6
45 - 50	0.86	25.5	38.0
50 - 55	0.83	21.6	33.4
55 - 60	0.81	18.0	29.0
60 - 65	0.77	14.8	24.8
65 - 70	0.76	11.9	20.8
70 - 75	0.74	9.2	17.2
75 - 80	0.70	6.8	13.9
80 - 85	0.63	4.7	10.9
85 and over	0.51	3.1	8.3

and health situations observed in 1990 are maintained throughout their lifetimes. The 15 percent dysfunction over the population's lifetime represents illnesses, both acute and chronic, that occur throughout a lifetime as measured by activity limitation and perceived health.

For people 65 years old, life expectancy was 20.8 years and the corresponding number of years of healthy life was 11.9. That is, of the expected years of life remaining, the population can expect to have an average of 57.2 percent of full function.

The National Center for Health Statistics is committed to further study of how activity limitation and perceived health interrelate to reflect the American people's view of a healthy life.

Source: Erickson, P., Wilson, R., and Shannon, I., Years of Healthy Life, *Healthy People 2000 Statistical Notes* Number 7, April 1995.

Optimal Calcium Intake

To address issues related to optimal calcium intake, the National Institutes of Health (NIH) convened a Consensus Development Conference in June of 1994. This conference brought together experts from many different fields, including osteoporosis and bone and dental health, nursing, dietetics, epidemiology, endocrinology, gastroenterology, nephrology, rheumatology, oncology, hypertension, nutrition and public education, and biostatistics, as well as representatives from the public. Conference members formulated a consensus statement in response to these six questions:

- What is the optimal amount of calcium intake?
- What are the important cofactors for achieving optimal calcium intake?
- What are the risks associated with increased levels of calcium intake?
- What are the best ways to attain optimal calcium intake?
- What public health strategies are available and needed to implement optimal calcium intake recommendations?
- What are the recommendations for future research on calcium intake?

Ten years earlier, in 1984, the NIH Consensus Development Conference on Osteoporosis suggested that increased intake of calcium might help prevent osteoporosis. This disease affects over 25 million Americans and is the major underlying cause of bone fractures in postmenopausal women and the elderly.

Optimal calcium requirements

Group	Optimal daily intake (in mg of calcium)
Infants	
Birth - 6 months	400
6 months - 1 year	600
Children	
1 - 5 years	800
6 - 10 years	800 - 1,200
Adolescents/young adults	
11 - 24 years	1,200 - 1,500
Men	
25 - 65 years	1,000
Over 65 years	1,500
Women	
25 - 50 years	1,000
Over 50 years (postmenopausal)	
On estrogens	1,000
Not on estrogens	1,500
Over 65 years	1,500
Pregnant and nursing	1,200 - 1,500

Source: National Institutes of Health, Office of the Director, 1994, Optimal Calcium Intake, NIH Consensus Statement, June 6-8, 12(4):1-31.

Each year the U.S. population incurs more than 1.5 million fractures costing over $10 billion in health care. Low calcium has also been implicated as a determinant of preeclampsia and several other chronic conditions, including colon cancer and hypertension. Current dietary intake data indicate that calcium intake is below recommended levels in most people.

Optimal Intake

Optimal calcium intake refers to the levels of consumption that are necessary for an individual to maximize peak adult bone mass, maintain adult bone mass, and minimize bone loss in the later years. Optimal calcium intake varies according to a person's age, sex, and ethnicity. Needs are greater during the periods of rapid growth in childhood and adolescence, during pregnancy and lactation, and in later adult life.

Optimum calcium intake for individuals of various ages is shown in the table. These guidelines are based on calcium from the diet plus calcium taken in supplemental form.

Cofactors That Enhance Absorption

Adequate vitamin D is essential for optimal calcium absorption. Sources of vitamin D, in addition to supplements, include sunlight, vitamin D-fortified liquid dairy products, cod liver oil, and fatty fish. The elderly are at greater risk for vitamin D deficiency because of insufficient vitamin D intake from their diet and inadequate sunlight exposure. Calcium and vitamin D need not be taken together to be effective.

Another possible cofactor that may enhance calcium absorption is physical activity, although the relationship has not been established conclusively. Immobilization, however, has been shown to produce a rapid decrease in bone mass.

Risks Associated With Increased Calcium

High levels of calcium intake have several potentially adverse effects. Overuse of calcium carbonate, for example, can produce calcium toxicity, with high blood calcium levels, severe renal damage, and ectopic calcium deposition. High calcium intakes can increase urinary calcium excretion and might increase the risk of stone formation in individuals with a history of kidney stones. Calcium intake, up to a total intake of 2,000 mg/day, appears to be safe in most individuals.

Attaining Optimal Calcium Intake

The preferred way to attain optimal calcium intake is through dietary sources. In addition, calcium-fortified foods and calcium supplements can be consumed. Dairy products are the major contributors of dietary calcium for many Americans. Other good food sources of calcium include some green vegetables (e.g., broccoli, kale, turnip greens, Chinese cabbage), calcium-set tofu, some legumes, canned fish, seeds, and nuts. A number of calcium-fortified food products are now available, including fortified juices, fruit drinks, breads, and cereals.

Public Health Strategies

Most Americans fail to meet currently recommended guidelines for calcium intake. Increasing calcium intake is one of the goals specified in *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* (U.S. Department of Health and Human Services, 1991) agenda.

According to the Consensus experts, public health strategies to promote optimal calcium intake should have a broad outreach and should involve educators, health professionals, and the private and public sectors. A public education program should: Disseminate consensus recommendations to the public; convene meetings of public leaders and representatives of national groups to disseminate information and develop action plans for public education; develop materials and programs for subpopulations; and work with national organizations and the media to encourage Americans to adopt health-promoting changes in their daily calcium intake.

Primary care physicians, dentists, and other health professionals must take the lead in educating patients about bone health and calcium intake. An educational program to support this work would: Disseminate consensus recommendations to health professionals; develop and distribute educational materials and curricula for health professional training programs; distribute educational materials through health professional organizations at their national and regional meetings; and conduct sessions at these meetings that promote optimal calcium intake and focus on calcium-related research.

The private sector can take an active role in promoting optimal calcium intake by: Developing and marketing a wide variety of calcium-rich foods; increasing the accessibility and visibility of calcium-rich foods in restaurants, grocery stores, and other food outlets; and developing cost-effective technologies to screen for populations who are at high risk of fracture.

Recommendations for the Federal Government are: Ensure that guidelines for calcium intake across all agencies, departments, and institutions are consistent and reflect the current state of scientific knowledge; the National Center for Health Statistics (NCHS) and the U.S. Department of Agriculture (USDA) should widely disseminate their data on nutrient intakes and food consumption patterns with respect to calcium; existing Federal food and food subsidy programs and federally regulated facilities for infants, children, low-income populations, and the elderly should ensure optimal calcium intake for program recipients; USDA should direct school food services to promote calcium intake by serving calcium-rich foods and including calcium in all nutrition education efforts; government cafeterias should serve as models to promote optimal calcium intake by serving calcium-rich foods and labeling them as such; and health care reform should address the need to include financial coverage of calcium supplements for those who cannot reach optimal calcium intake through diet alone and the need for screening of target populations to identify those who are at high risk of fracture and who would benefit from increased calcium intake.

Recommendations for Future Research

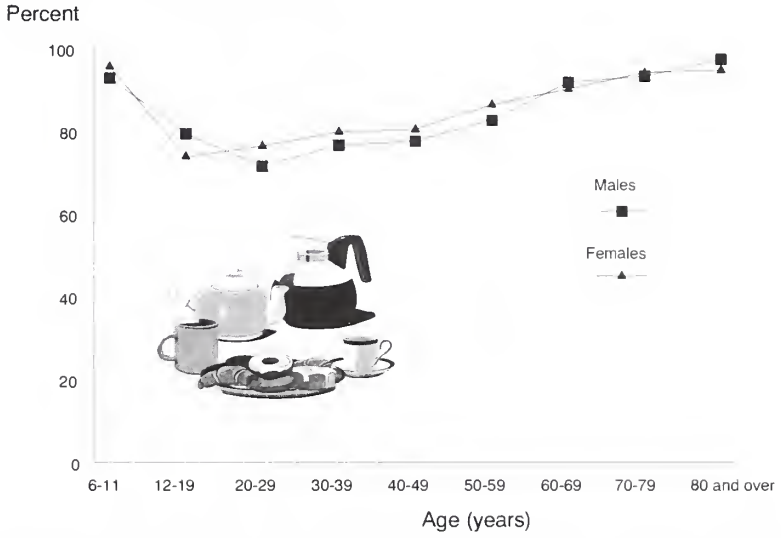
Among the recommendations from the NIH Consensus Development Conference for future research are:

- Studies of the long-term effects of calcium intake on regional (e.g., spine, hip, forearm) changes in bone mass and on fracture incidence in postmenopausal women and in older men;
- Studies of adolescents to investigate the long-term effects of different levels of calcium intake on the achievement of peak bone mass;
- Studies of optimal calcium intake and the potential role of declining levels of estrogen in the decade before menopause;
- Studies of interactions between calcium supplementation and the absorption of other nutrients;
- Studies of optimal calcium requirements in different ethnic populations;
- Studies of the effect of dietary calcium on bone mass and fracture incidence;
- Development of a cost-effective means by which calcium-deficient individuals can be identified at all ages;
- Development of effective health-promoting programs to change behavior with respect to calcium intakes aimed at certain subgroups of the population;
- Evaluation of the effect of long-term calcium supplementation on the development or prevention of kidney stones.

Source: National Institutes of Health, Office of the Director, 1994, *Optimal Calcium Intake, NIH Consensus Statement,* June 6-8, 12*(4)*:1-31.

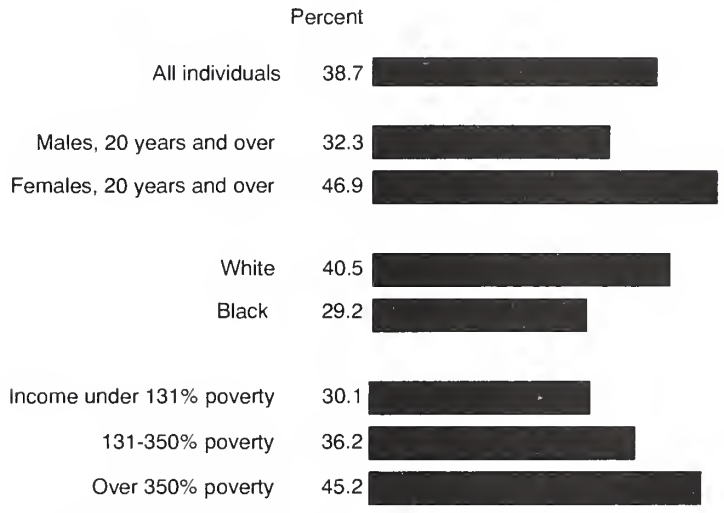
Charts From Federal Data Sources

Percentage of individuals who reported eating breakfast, by age and sex, 1 day, 1989-91



Source: Food and Nutrient Intakes by Individuals in the United States, 1 Day, 1989-91, NFS Report No. 91-2.

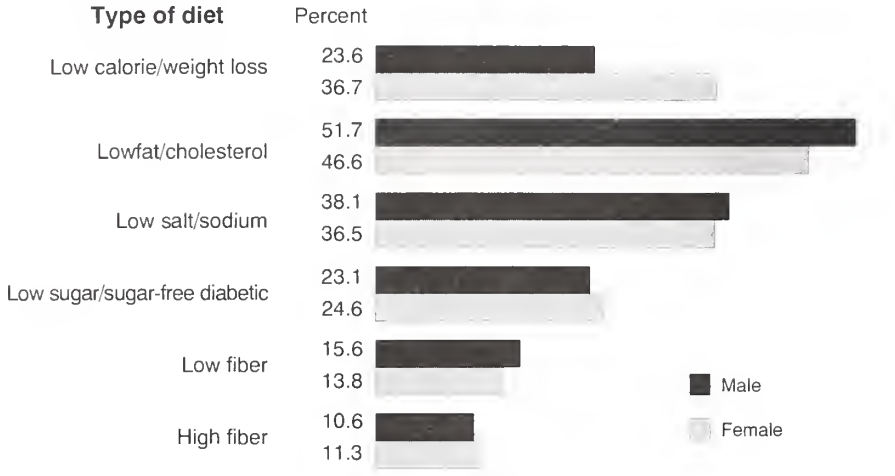
Percentage of individuals using[1] vitamin/mineral supplements, 1989-91



[1]Includes individuals reporting regular and occasional use of vitamin and/or mineral supplements, not those using in 1 day.

Source: Food and Nutrient Intakes by Individuals in the United States, 1 Day, 1989-91, NFS Report No. 91-2.

Percentage of individuals 20 years and over who reported being on special diets,[1] by sex and type of diet, 1989-91



[1]Multiple responses were possible; therefore, percentages may sum to more than 100 percent.

Source: Food and Nutrient Intakes by Individuals in the United States, 1 Day, 1989-91, NFS Report No. 91-2.

Unemployment rate, 16 years and over, 1961-94

Source: U.S. Department of Labor, 1995, Employment and Earnings 42(8), Table A-1.

Recent Legislation Affecting Families

Public Law 104-29 (enacted September 30, 1995)—the Truth in Lending Act Amendment of 1995 clarifies the intent of the Act and reduces burdensome regulatory requirements on creditors. The law delineates the situations in which the mortgagor of a mortgage on a private home may rescind the mortgage.

Public Law 104-35 (enacted October 12, 1995)—amends the Social Security Act to extend by 2 years the deadline by which States are required to have in effect an automated data processing and information retrieval system for use in the administration of State plans for child and spousal support. The law extends the deadline from October 1, 1995 to October 1, 1997. The major overhaul of Federal child support laws passed by Congress in the Family Support Act of 1988 contained extensive requirements that States had to meet in establishing automatic data processing systems. State systems had to have the capability to: (a) control and monitor the major factors in support collection and paternity establishment, (b) provide coordination with records of the State Aid to Families and Dependent Child program, (c) provide security against unauthorized access, (d) facilitate income withholding and other collection procedures, and (e) provide management information on all child support cases being handled by the State program.

In 1988, few States had automated a significant portion of their child support program. To make certain that (1) the U.S. Department of Health and Human Services (HHS), (2) the private contractors that would help the States design and implement their systems, and (3) the States themselves moved aggressively on the data processing requirements, Congress provided States with 90 percent Federal funding and established October 1, 1995, as the deadline for completing the systems. Although every State has an approved plan for implementing a system that meets all the requirements of the 1988 legislation, to date only one State has actually finished its system and received final approval from HHS. HHS estimates that even 6 months after the deadline, only 18 States will be able to meet all the requirements of the 1988 law. A delay by HHS in the release of final regulations that provided detailed specifications for the data systems, a shortage of qualified vendors, and a shortage of technical assistance from HHS warranted, in the opinion of the Committee on Ways and Means, a 2-year extension of the deadline.

Public Law 104-36 (enacted October 12, 1995)—The Small Business Lending Enhancement Act of 1995 reduces the level of participation by the Small Business Administration (SBA) in certain business loans guaranteed by the Federal Government. The credit subsidy rate for the SBA's small business loan guarantee program decreases from 2.74 percent to 1.29 percent. Thus, a larger loan program can be supported by a smaller appropriation: in FY95, an appropriation of $214 million supported a loan program of $7.8 billion; in FY96, an appropriation of $133 million will support a program of $10.5 billion in loans.

Public Law 104-51 (enacted November 15, 1995)—amends the Immigration and Nationality Act to update references in the classification of children for purposes of U.S. immigration laws. The term "legitimate child" has been changed to "child born in wedlock" and the term "illegitimate child" has been changed to "child born out of wedlock."

Public Law 104-59 (enacted November 28, 1995)—The National Highway System Designation Act of 1995 repeals the national 55 mph speed limit that was enacted in 1974. In addition, the law removes penalties on States that do not require motorcycle helmets; removes the requirement that highway signs designate distances in kilometers; removes the requirement that old tire rubber be used in highway construction; allows States to erect billboards on portions of scenic highways; requires States to strictly enforce drunken-driving laws for drivers under 21 years old and lowers the under-21 blood-alcohol threshold to 0.02 percent for drunken-driving convictions. Also, the law provides all funds for the rehabilitation of the Wilson Bridge and planning for a new Potomac crossing between Maryland and Virginia.

Research and Evaluation Activities in USDA

From the Office of Analysis and Evaluation, Food and Consumer Service

The Office of Analysis and Evaluation, Food and Consumer Service has several new projects of interest to the nutrition community.

State Agency Nutrition Support Networks

The Food and Consumer Service (FCS) entered into cooperative agreements with 12 States to demonstrate alternative ways to form and maintain nutrition support networks that involve the Food Stamp program. The vision is to develop Statewide networks consistent with the Department's message: Emphasis on the Dietary Guidelines, reliance on integrated community-based efforts, State flexibility, and use of innovative social marketing approaches to nutrition promotion. Once the networks are created, the expectation is that they will use a combination of State, private, and Federal funds to create a nutrition promotion effort that involves the traditional nutrition education partners as well as 5-a-day coalitions and innovative community organizations. States receiving initial funds are Alabama, Arizona, California, Georgia, Iowa, Indiana, Maine, Minnesota, Missouri, Vermont, Virginia, and Washington.

Interactive Nutrition Education Grants

FCS awarded six grants to demonstrate and evaluate interactive nutrition education technologies and processes. The grantees are:

- The Texas Agricultural Extension Service and the Texas Bureau of Nutrition Services will modify an English and Spanish compact disk for WIC clients that provides interactive information on the Food Guide Pyramid and food buying and preparation. They will convert the information from a compact disk (which looks like a VCR) to a CD-ROM, expand modules on new food labeling, food safety, and meal preparation; and add a section on snack foods. Material will be presented in writing at a fifth grade level and using voice-over for those unable to read. The target population will include an emergency assistance program, Head Start, and a one-stop-shopping community facility. They will serve low-income Asian-Pacific Island, African-American, Hispanic, and Caucasian children and parents, many of whom receive food stamps and WIC.
- The University of North Carolina's Department of Nutrition will modify an interactive computer-based nutrition education program for women. The program—designed for Food Stamp participants—uses a soap-opera and infomercial format to convey nutrition messages and collect information on household characteristics, dietary habits, and nutrition knowledge. The new program will be expanded to low-income women and families who attend WIC or health clinics. Additions will include: The Food Guide Pyramid as a meal planning tool; prenatal nutrition messages; new infomericals, illustrations, and questions; and enhanced graphics and narration. UNC will develop a self-administered program running on CD-ROM and laser disc housed in kiosks at the clinics.
- The University of California at Berkeley's School of Public Health will modify a dietary assessment and nutrition education CD-ROM to include assessments of food sufficiency, stages of readiness for dietary change, income level, and food stamp status. The food intake assessment will focus on USDA's Team Nutrition themes and be tailored for ethnic groups. The project will target the message directly to low-income English- and Spanish-speaking families. CD-ROM's will be placed in three health clinics located in low-income communities.
- The New Mexico State University will redesign an interactive, touch screen nutrition education system that provides Navajo people with information on food safety and quality. They will (1) redesign the system to be trilingual (Navajo, English, and Spanish); (2) test it in public locations frequented by low-income households such as food stores, community centers, welfare offices, and WIC and health clinics; and (3) provide free CD-ROM versions of the system to schools in Navajo and Hispanic communities. The redesign will

also include information on the Food Guide Pyramid, Team Nutrition messages, healthy eating for babies and children, shopping tips, and monitoring fat intake.

- The University of Massachusetts will use an Internet-accessible computer bulletin board that can be interactively tailored to the user's interest and dietary patterns. They will modify an interactive nutrition analysis program by creating a specific file area for the project target group. The user indicates the type and amount of food consumed and receives assessments based on the Food Guide Pyramid. The e-mail capability can also be operated by users to ask questions and identify topics of interest. The Nutrition Department will respond to the questions and provide other information such as Team Nutrition messages. The target population will include low-income adult education and English-as-a-Second-Language students who attend classes offered by a community college. Other participants will be young, pregnant, or parenting women who have dropped out of school and receive public assistance. They will be reached through a community center that serves them. Four hours of class time per week will be set aside for the program.
- DINE Systems, Inc. will demonstrate and evaluate the Pyramid Challenge in an elementary school in Buffalo, New York. The program is a healthy eating guide based on the Food Guide Pyramid. The intent is to show users what they should eat each day, help them identify what they have eaten, and encourage users to balance their diets. The method of delivery is CD-ROM with point-and-click or touch-screen interactive modes. DINE will modify the existing program to make it more visually interesting and add more foods including standard school lunch menu items. They will also develop a curriculum for teachers.

WIC Special Project Grants

Public Law 103-448, The Healthy Meals for Healthy Americans Act of 1994, the WIC reauthorization legislation, included a provision to set aside up to $10 million annually for infrastructure development, special State projects, and breastfeeding promotion/support projects. In Fiscal Year 1995, FCS awarded special project grants to the Michigan and Wyoming WIC Programs. Michigan's grant will be used to expand and evaluate an existing breastfeeding peer counseling initiative. The evaluation will measure differences in breastfeeding initiation and duration rates between women who receive regular WIC breastfeeding promotion and support services and those enrolled in the peer counseling initiative. The Wyoming special project grant will be used to conduct and evaluate a demonstration of the Western Governor's Association Health Passport card. The card will be used to store information and to improve integration and coordination of participants' utilization of WIC, Head Start, and other health care services.

Conference on Access to Food

FCS sponsored this Conference that brought over 150 business owners, researchers, advocates, Federal officials, and civic leaders from Empowerment Zones and Enterprise Communities to the Georgetown University Conference Center in Washington, DC, in September 1995. Goals were to:

- Present successful strategies to increase access to food, through the development of full-line, affordable food stores, as well as alternative means (e.g., farmers' markets), in urban and rural underserved areas;
- Provide a discussion forum for experts in supermarket and food-store development, economic development, and food policy; and
- Identify and support continued efforts to link improved food access to local economic development and the Empowerment Zones/Enterprise Communities process.

Proceedings of the conference will be available in the Spring of 1996.

From the Beltsville Human Nutrition Research Center, Agricultural Research Service

Results from the 1994 Continuing Survey of Food Intakes by Individuals are now available. Data were obtained by 24-hour recall from over 5,500 respondents. Highlights from USDA's newest food consumption survey include:

- **Fat accounted for 33 percent of calories in the American diet.** This represents a continued decrease from 34 percent in 1989-91 and 40 percent in 1977-78. However, only about one-third of adults met the 30 percent or less of calories from fat recommended by nutritionists.
- **Adult females failed to meet the Recommended Dietary Allowances (RDA) for six nutrients—** iron, zinc, vitamin B-6, calcium, magnesium, and vitamin E. Adult males fell short of the RDA for zinc and magnesium.
- **About one in three adults were overweight** based on self-reported height and weight compared with about one in five in the late 1970's. Thirty percent of adult males and 45 percent of adult females reported that they rarely or never exercised.
- **Consumption of grain-based products is on the rise.** For example, between the late 1970's and 1994, Americans increased their consumption of ready-to-eat cereal by 60 percent and their consumption of snacks such as crackers, popcorn, pretzels, and corn chips by 200 percent.
- **Consumption of vegetables increased slightly.** However, Americans still consume low amounts of dark green and deep yellow vegetables, despite recommendations to do otherwise.
- **Among young children, consumption of fluid milk decreased by 16 percent since the late 1970's, while consumption of carbonated soft drinks increased by 23 percent.** Consumption of noncitrus juices, including grape- and apple-based mixtures, rose by 304 percent.
- **About 85 percent of Americans ate breakfast, about the same as in previous USDA surveys.** Coffee and fluid milk are still the most popular foods consumed at breakfast. However, less bacon and eggs but more ready-to-eat cereal and fruit are reported for breakfast.
- **Over 50 percent of Americans ate away from home on any given day.** Foods eaten away from home accounted for more than 25 percent of total calories and fat intakes.
- **The percentages of adult females and young children eating away from home on any given day increased by about 50 percent since the late 1970's.** This supports other sociodemographic trends showing that more women are working outside the home and that more children are in day care.
- **For adult males, carbonated soft drinks were the most popular food item consumed outside the home, followed by salads and coffee.** French fried potatoes; foods such as pizza, lasagna, and ravioli; and Mexican foods were also reported more frequently than in previous surveys.

For information on obtaining 1994 CSFII microdata on CD-ROM:

Survey Systems/Food Consumption Laboratory
Beltsville Human Nutrition Research Service
Agriculture Research Service
U.S. Department of Agriculture
4700 River Road, Unit 83
Riverdale, MD 20737
Telephone: (301) 734-8457

For information on purchasing 1994 CSFII microdata on magnetic tape:

National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Telephone: (703) 487-4650
Accession number: PB96-500095

To access information about USDA surveys on the Internet, use Gopher:

Gopher to gopher.nalusda.gov, to the National Agricultural Library's directory, then:
Select "NAL Information Centers"
Select "Food and Nutrition Information Center, USDA"
Select "Agricultural Research Service—Nutrition Information"
Select "Survey Systems/Food Consumption Laboratory"

Data Sources

Behavioral Risk Factor Surveillance System (BRFSS)

Sponsoring agency: U.S. Department of Health and Human Services

Population covered: Adults 18 years and over residing in households with telephones in participating States.

Sample size: From about 23,000 in 1984 (mean per State=1,537) to about 102,000 in 1993 (mean per State=2,040).

Geographic distribution: The number of participating States has increased from 15 in 1984 to 50 in 1993.

Years data collected: Continuously since 1984 (optional modules for the assessment of dietary fat and fruit and vegetable consumption were added to the System in 1990).

Method of data collection: Telephone interviews.

Future surveys planned: The 1994 survey was released in January 1996.

Major variables: The State-based BRFSS accesses the prevalence of personal health practices that are related to the leading causes of death. For comparability, many questions from national surveys, such as the National Health Interview Surveys and the National Health and Nutrition Examination Surveys, are included. Core topics include demographic variables; health status; access to health care; awareness of selected medical conditions; injury control; tobacco use and alcohol consumption; women's health concerns; use of other preventive services, such as immunization for influenza and pneumonia; and knowledge, attitudes, and beliefs regarding AIDS. BRFSS is a source of baseline data for the Healthy People 2000: National Health Promotion and Disease Prevention Objectives, as well as a means of tracking progress toward these objectives.

Sources for further information and data:
Centers for Disease Control
and Prevention
4770 Buford Highway, NE (MS-K30)
Atlanta, GA 30341
(404) 488-5294

National Survey of Family Growth (NSFG)

Sponsoring agency: U.S. Department of Health and Human Services

Population covered: Women of reproductive age (15-44 years). In the first two surveys, never-married women without children were excluded.

Sample size: 8,000 to 10,500 women. In 1995, sample included all available Hispanic and Black women plus 6,200 White and other women from the 1993 National Health Interview Survey.

Geographic distribution: Nationwide

Years data collected: 1973, 1976, 1982, 1988, 1990, and 1995.

Method of data collection: 1973-90—personal interviews lasting about 1 hour. In 1995, Computer-Assisted Personal Interviewing was used in combination with Audio Computer-Assisted Self-Interviewing for sensitive data.

Future surveys planned: The 1995 survey is expected to be released in September 1996.

Major variables: A wide range of information on fertility, family planning, and aspects of maternal and child health that are closely related to fertility and family planning, such as birth weight, breast-feeding, and prenatal care. Also, demographic variables such as residence, religion, race/ethnicity, occupation, and income. In 1995, new variables include education, parent living arrangements, work history, smoking history, and cohabitation history.

Sources for further information and data:
Center for Disease Control
National Center for Health Statistics
Family Growth Survey Branch
6525 Belcrest Road, Room 840
Hyattsville, MD 20782
(301) 436-8731

Journal Abstracts

The following abstracts are reprinted verbatim as they appear in the cited source.

Guthrie, J.F., Fox, J.J., Cleveland, L.E., and Welsh, S. 1995. Who uses nutrition labeling, and what effects does label use have on diet quality? ***Journal of Nutrition Education*** **27*(4)*:163-172.**

Information on the characteristics of individuals using nutrition labeling and the effects of label use on diet quality can be used to guide the development of more effective consumer education programs. For this study, data from the U.S. Department of Agriculture's (USDA) 1989 Continuing Survey of Food Intakes by Individuals (CSFII) and Diet and Health Knowledge Survey (DHKS) were used to identify socioeconomic, demographic, and health-related characteristics and the nutrition-related knowledge and attitudes that were associated with label use. This analysis employed a theoretical model of determinants of label use that was based on an economic model of information search. Characteristics found to be positively associated with the likelihood of using nutrition labeling were having at least some college education, being female, living with others rather than living alone, being more knowledgeable about nutrition, believing that following the principles of the Dietary Guidelines for Americans is important, and being more concerned about nutrition and product safety and less about taste when shopping for food. Having identified the characteristics of label users, this information was used in a model of nutrient consumption that was based on consumer demand theory. A selectivity analysis was employed to correct for potential self-selection bias on label use. Label use appeared to be associated with the consumption of diets that were higher in vitamin C and lower in cholesterol. However, label use in 1989 did not significantly influence the intake of 24 other food components investigated.

Kennedy, E.T., Ohls, J., Carlson, S., and Fleming, K. 1995. The Healthy Eating Index: Design and applications. ***Journal of the American Dietetic Association*** **95*(10)*:1103-1108.**

The Healthy Eating Index, which calculates a composite score based on 10 components of healthful eating, provides a measure of the overall quality of Americans' diets. Developed by the US Department of Agriculture, the Index assigns scores from 1 to 10 that measure how closely a person's diet reflects dietary advice regarding intake of five food groups (grains, vegetables, fruits, milk, and meat) and four nutrients (total fat, saturated fat, cholesterol, and sodium); the Index also scores the amount of variety in a diet. When applied to dietary survey data from 1989 and 1990, the mean Healthy Eating Index for both years combined was 63.9 out of a possible 100 points. No one category contributed disproportionately to the mean composite score, but mean component scores were lowest for intake of fruits (4.0) and saturated fat (5.1) and highest for intake of meat (7.5) and cholesterol (8.0).

Pepper, J.V. 1995. Dynamics of the intergenerational transmission of welfare receipt in the United States. ***Journal of Family and Economics Issues*** **16*(2/3)*:265-279.**

Using data from the Panel Study of Income Dynamics, this article expands upon earlier empirical efforts to understand intergenerational welfare participation in the United States. Empirical studies have suggested that growing up in a household that receives Aid to Families with Dependent Children (AFDC) increases the probability that a child will receive AFDC, although little insight exists on the dynamics of this relationship. In particular, no one has formally examined how the time a daughter spends on AFDC varies from the time her parents receive welfare. By observing the behavior of parents and their daughters for five years, this study examines the length of participation in AFDC across generations. The results imply that growing up in a household that receives AFDC increases the amount of time that a daughter will also receive aid, although the time a daughter receives AFDC is not affected by the length of time parents receive AFDC.

Cost of Food at Home

Cost of food at home estimated for food plans at four cost levels, December 1995, U.S. average[1]

Sex–age group	Cost for 1 week				Cost for 1 month			
	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan
FAMILIES								
Family of 2:[2]								
20 - 50 years	$53.90	$68.30	$84.40	$105.10	$233.50	$295.90	$365.30	$455.00
51 years and over	50.80	65.70	81.30	97.20	220.30	284.90	352.10	421.60
Family of 4:								
Couple, 20 - 50 years and children—								
1 - 2 and 3 - 5 years	78.50	98.40	120.50	148.20	340.30	426.60	521.80	642.10
6 - 8 and 9 - 11 years	90.00	115.70	144.50	174.10	390.10	501.40	626.00	754.50
INDIVIDUALS[3]								
Child:								
1 - 2 years	14.20	17.40	20.40	24.70	61.60	75.50	88.30	107.10
3 - 5 years	15.30	18.90	23.40	28.00	66.40	82.10	101.40	121.40
6 - 8 years	18.70	25.10	31.30	36.40	81.20	108.80	135.60	157.80
9 - 11 years	22.30	28.50	36.50	42.20	96.60	123.60	158.30	183.10
Male:								
12 - 14 years	23.10	32.30	40.00	47.10	100.20	139.80	173.50	204.00
15 - 19 years	23.90	33.20	41.30	47.90	103.60	143.90	179.20	207.50
20 - 50 years	25.80	33.00	41.30	50.10	111.60	143.10	178.90	217.10
51 years and over	23.30	31.50	38.90	46.60	100.90	136.70	168.40	202.00
Female:								
12 - 19 years	23.20	27.90	33.80	40.90	100.60	120.70	146.40	177.00
20 - 50 years	23.20	29.10	35.40	45.40	100.70	125.90	153.20	196.50
51 years and over	22.90	28.20	35.00	41.80	99.40	122.30	151.70	181.30

[1]Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for the thrifty food plan were computed from quantities of foods published in *Family Economics Review* 1984(*1*). Estimates for the other plans were computed from quantities of foods published in *Family Economics Review* 1983(*2*). The costs of the food plans are estimated by updating prices paid by households surveyed in 1977–78 in USDA's Nationwide Food Consumption Survey. USDA updates these survey prices using information from the Bureau of Labor Statistics, *CPI Detailed Report*, table 4, to estimate the costs for the food plans.

[2]Ten percent added for family size adjustment. See footnote 3.

[3]The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person—add 20 percent; 2-person—add 10 percent; 3-person—add 5 percent; 5- or 6-person—subtract 5 percent; 7- or more-person—subtract 10 percent.

Consumer Prices

Consumer Price Index for all urban consumers [1982-84 = 100]

Group	Unadjusted indexes			
	December 1995	November 1995	October 1995	December 1994
All items	153.5	153.6	153.7	149.7
Food	149.9	149.4	149.4	146.8
Food at home	150.3	149.5	149.7	147.3
Food away from home	150.4	150.2	150.0	147.1
Housing	149.7	149.4	149.7	145.4
Shelter	167.4	167.3	167.3	161.8
Renters' costs[1]	173.2	173.8	175.3	168.2
Homeowners' costs[1]	174.0	173.5	173.0	167.8
Household insurance[1]	158.3	157.6	157.1	155.4
Maintenance and repairs	136.6	136.2	136.3	132.7
Maintenance and repair services	142.1	141.8	141.8	137.0
Maintenance and repair commodities	129.1	128.7	128.9	126.8
Fuel and other utilities	123.7	123.1	123.9	122.0
Fuel oil and other household fuel commodities	89.6	87.7	86.9	88.4
Gas (piped) and electricity	118.3	117.6	119.3	117.4
Household furnishings and operation	123.8	123.6	123.9	120.8
Housefurnishings	111.1	111.0	111.7	110.3
Apparel and upkeep	130.6	133.7	134.5	130.5
Apparel commodities	127.1	130.6	131.4	127.2
Men's and boys' apparel	126.0	128.4	128.4	125.3
Women's and girls' apparel	124.7	129.5	130.6	125.7
Infants' and toddlers' apparel	128.7	129.7	131.0	131.3
Footwear	124.1	126.7	127.5	123.6
Apparel services	157.7	157.2	157.0	156.4
Transportation	139.1	139.4	139.4	137.1
Private transportation	136.6	136.5	136.3	134.9
New vehicles	142.8	142.2	140.9	140.1
Used cars	158.2	157.8	157.2	151.5
Motor fuel	96.4	96.4	98.3	100.4
Maintenance and repairs	155.7	155.7	155.4	151.9
Other private transportation	172.4	172.7	172.0	167.6
Public transportation	170.7	177.5	178.7	165.6
Medical care	223.8	223.5	222.9	215.3
Medical care commodities	206.6	206.3	205.7	202.9
Medical care services	227.8	227.4	226.9	218.2
Professional medical services	203.9	203.4	202.9	196.0
Entertainment	156.2	156.0	155.2	151.2
Entertainment commodities	140.7	140.6	139.6	136.8
Entertainment services	174.6	174.3	173.6	168.3
Other goods and services	211.1	211.2	210.7	202.4
Personal care	148.9	148.9	148.5	145.8
Toilet goods and personal care appliances	144.1	144.8	144.4	142.6
Personal care services	154.3	153.5	153.0	149.2
Personal and educational expenses	241.8	241.6	241.3	229.2
School books and supplies	219.0	218.6	217.7	207.4
Personal and educational services	243.7	243.5	243.2	231.1

[1]Indexes on a December 1982 = 100 base.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

Guidelines for Authors

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